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THESIS

**ANALYSIS OF MEASURES OF PERFORMANCE AND
CONTINUOUS IMPROVEMENT AT THE NAVAL
DENTAL CENTER PEARL HARBOR, HAWAII**

by

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December 2000

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CONTINUOUS IMPROVEMENT AT THE
NAVAL DENTAL CENTER PEARL HARBOR, HAWAII**

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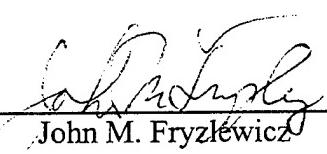
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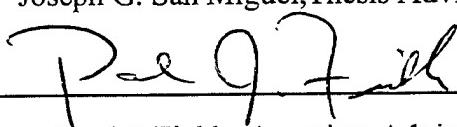


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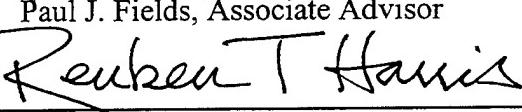
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ABSTRACT

The Balanced Scorecard, developed by Robert S. Kaplan and David P. Norton, is a strategic management tool that has been successfully implemented in the private sector. This tool uses a balance of a historical perspective (financial) and three operational perspectives (customer service, internal business processes, and innovation and learning) that allow managers to readily evaluate an organization's performance towards achieving its vision and mission. This study examines the applicability of the Balanced Scorecard concept to Government organizations as a potential strategic management tool. The Government organization chosen to test this applicability was the Naval Dental Center Pearl Harbor (NDCPH) because it was recognized in 1998 for its organizational excellence by receiving the Hawaii State Award of Excellence, and the author's personal experiences onboard NDCPH as comptroller. The study centered on analyzing NDCPH's Mission, Vision, Key Success Factors (KSFs), and performance metrics, for use in developing a proposed Balanced Scorecard framework. This was done by equating the KSFs with Kaplan and Norton's perspectives and then matching appropriate performance metrics to the KSFs. A Balanced Scorecard framework that followed Kaplan and Norton's concept was recommended. The potential for adapting this framework to other Naval Dental Centers was also demonstrated.

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I. INTRODUCTION

A. PURPOSE

The purpose of this thesis is to provide the necessary information to determine how a model Balanced Scorecard [Ref. 1] can be developed from performance measurement and continuous improvement monitoring at the Naval Dental Center in Pearl Harbor, Hawaii. Such a model could be used as a strategic management tool at other Naval Dental Centers.

B. BACKGROUND

Measures of strategic performance are vital to the future of all organizations whether governmental or non-governmental. Strategic management decisions should be made with regard to these performance measures. Financial measures of performance can provide information on past accomplishments but these alone are usually not sufficient to aid in long term management. The Balanced Scorecard, a concept developed by Robert S. Kaplan and David P. Norton, adds three other areas of performance measures that organizations should monitor, in addition to financial measures, as a tool for management. These three areas are customers, internal business processes, and learning and growth. Although the Balanced Scorecard was intended for profit-oriented organizations, its concepts have been applied to non-profit organizations, such as government agencies as well. [Ref. 1 and 2]

In fact, as part of the National Performance Review and Re-invention programs of the Clinton administration, Congress enacted a law in 1993, the Government Performance and Results Act (GPRA), which has concepts similar to the Balanced Scorecard approach to management. Federal managers, who must already monitor their

financial management practices must also "focus on results, service quality, and customer satisfaction" and "improve internal management of the federal government". [Ref. 3]

A government service organization that will be the focus of this thesis is the Naval Dental Center Pearl Harbor (NDCPH), Hawaii. It is a service organization whose mission is to provide comprehensive dental services to approximately 20,000 active duty Navy and Marine Corps personnel stationed, home ported, or in transit in the state of Hawaii. The NDCPH command consists of five branch dental clinics and a headquarters command all situated on the island of Oahu. The main branch clinic and the Headquarters Command are co-located in Pearl Harbor. This is the largest branch clinic by far and provides a comprehensive array of dental services. The other four branch clinics are smaller and provide more limited services in different locations on Oahu. Although not in direct competition, the US Army and Air Force also have dental clinics on the island of Oahu and provide dental care for their respective military personnel.

NDCPH is directed by higher authority, the Navy Bureau of Medicine and Surgery (BUMED) to measure and report its operating performance, as is any federal organization. BUMED mandates certain performance measures that are common to all Naval Dental Centers in the United States and worldwide. Other performance measures are developed locally and may depend on command strategies or customer desires.

In 1998 the leadership of NDCPH, proud of the command's measures of organizational performance and desiring outside validation of its efforts, learned of a state Chamber of Commerce award called the Hawaii State Award of Excellence (HSAE). This award offered a non-military validation of NDCPH's performance efforts. NDCPH pursued the HSAE.

In 1998, NDCPH was one of three organizations in Hawaii presented with the "Hawaii State Award of Excellence" (HSAE). This award is based on the criteria developed by the "Malcolm Baldrige National Quality Award" [Ref. 4] and is presented to organizations which have been undergone a rigorous evaluation and found to demonstrate exceptional standards of organizational excellence. The criteria for the award is also very similar to the criteria for Kaplan and Norton's Balanced Scorecard and the U.S. government's GPRA, specifically measuring performance through customer satisfaction, internal management and business processes, employee improvement, and financial measures.

C. RESEARCH OBJECTIVE

The objective of this thesis is to analyze performance measures at NDCPH and evaluate how they fit into a Balanced Scorecard model and GPRA standards. Specific attention will be shown to data that was gathered for the HSAE award, which could be considered as benchmarks, and data gathered during a twelve-month period following the award.

Also important to note is that a scheduled change in command occurred after the HSAE data was submitted. Changes inherent in new leadership should also be reflected in performance measures whether due to changes in business processes, strategies or managerial style. Any positive changes in performance measures could be an indicator of continuous success in meeting the mission. New business processes, positive trending (or even negative trending) performance measures and other success stories could be shared among other dental centers as part of a larger continuous improvement effort. Efficiency in care delivery could reduce the cost of care as well as the cost of lost man-hours from

work and deployment. Finally, increased patient satisfaction could lead to less missed appointments and fewer complicated dental patients who had been avoiding treatment.

D. RESEARCH QUESTIONS

The primary research question is: How can a Balanced Scorecard model of performance measurement be applied to NDCPH?

Secondary, supportive research questions are:

1. How can this model be applied to other Naval Dental Center's as a tool for strategic management?
2. Would this Balanced Scorecard provide evidence of complicity of a Government organization to the GPRA?
3. Who are the customers and stakeholders of performance at NDCPH?
4. What performance measures were in place when NDCPH won the Hawaii State Award of Excellence (HSAE) and afterward?
5. What was the criteria for the HSAE and is there a relationship to the Balanced Scorecard?
6. What continuous improvement efforts followed the award and why?
7. What effect did new leadership have on NDCPH's managerial strategy and performance measures?

E. SCOPE OF RESEARCH

This thesis includes a complete review of the pre- and post- HSAE measures of performance and significant business processes in place at NDCPH. This thesis is also intended to acquaint the reader with an understanding of the basic elements of the GPRA, the HSAE and the Balanced Scorecard concept, and the similarities of each. Recommendations were provided for improving performance measurement and strategic management of Naval Dental Centers through the Balanced Scorecard.

It is assumed that the reader has a basic knowledge of commercial and government service organizational structure as well as business, management and accounting terminology. The reader should be aware that the following terms, framework and model, and measure and metric will be used interchangeably.

F. RESEARCH METHODOLOGY

The research methodology starts with a comprehensive review of literature related to the Balanced Scorecard, GPRA and HSAE, and a review of the performance measurement data and significant business processes in place at NDCPH during the HSAE and a twelve-month period following. An analysis of the performance measures and data and their relationship to the HSAE, Balanced Scorecard and GPRA criteria will be performed throughout the thesis as applicable. This analysis should lead to development of a generic Balanced Scorecard model for NDCPH and end with evaluating applicability of such a model for Naval Dental Centers as a management tool.

The literature research included (1) books, (2) professional journals and periodicals, (3) DOD publications, (4) Government and private Internet sources, (5) archival data from NDCPH, (6) NDCPH's HSAE submission booklet, and (7) interviews with relevant NDCPH staff, conducted via electronic mail.

G. ORGANIZATION OF STUDY

This thesis contains six chapters. Chapter I provides the background of the study and introduces the thesis subject. Also included were brief comments on the purpose of the study, primary and secondary research questions that the study was framed around, scope of the study, and research methodology. Chapter II will expound on pertinent information discovered in the literature review intending to add to the readers' knowledge

and understanding of the concepts introduced in the study such as the Balanced Scorecard, GPRA and the HSAE (Malcolm Baldridge National Award) and will discuss NDCPH's HSAE submission booklet. Chapter III will present the methodology used in the study. Chapter IV will be a presentation and analysis of relevant data and information collected. Lastly, Chapter V will conclude the thesis with findings and recommendations resulting from the study.

II. LITERATURE REVIEW

This chapter, through a discussion of relevant literature, will provide a general understanding of the Balanced Scorecard concept, the Government Performance Results Act of 1993 (GPRA), the Hawaii State Award of Excellence (HSAE) and will conclude with a brief overview of NDCPH's HSAE Application.

A. THE BALANCED SCORECARD CONCEPT

1. Origins

Measuring performance in service organizations has always been difficult due the lack of tangible outputs or products. The dramatic increase of service-based organizations within the U.S. economy exacerbated this problem. [Ref. 5]

Robert S. Kaplan and David P. Norton addressed this need of improving performance measuring in service organizations in 1992 through developing the balanced scorecard concept [Ref. 6]. The concept grew out of a yearlong research project that involved several companies with a history of demonstrating useful innovations in performance measurement. Kaplan and Norton expanded on their original concept through subsequent articles [Ref. 7,8] and a book titled *The Balanced Scorecard: Translating Strategy into Action* [Ref. 2].

Since its inception, Kaplan and Norton's concept has attracted significant attention of many organizations in the private and public sectors. An example of its wide interest was noted in a recent "World Wide Web"- based search of the term "balanced scorecard", which resulted in over 900,000 "hits" (listings). Additionally, a 1998 survey of "Fortune 1000" organizations indicated that sixty percent of them have had experience with the balanced scorecard [Ref. 9]. Websites devoted to assisting Federal agencies with

using the balanced scorecard are also now available [Ref. 10,11]. The balanced scorecard concept will now be explained.

2. Features

Kaplan and Norton's balanced scorecard provides managers with an alternative method of measuring overall organizational performance that not only utilizes financial data, which measures historical performance, but also adds three "nonfinancial" areas of measure. These three broad nonfinancial areas involve customer service, internal processes, and innovation and improvement. The balanced scorecard "balances" the traditional measures with three nonfinancial areas that may give a better picture of future performance. [Ref. 1,2]

a. *The Four Components of the Balanced Scorecard [Ref.2]*

(1) Financial Measures. These measures are important indicators of how well an organization's current strategies are performing. They are not necessarily very good measures of future (strategic) events because they are measures of past events. Examples include operating income or sales growth.

(2) Customer Service Measures. These measures involve evaluating the effectiveness of an organization's strategies in attracting, satisfying and retaining customers. Examples of measures include customer satisfaction surveys or market share changes.

(3) Internal Business Processes. These are measures of internal processes that are critical (strategic) to the success of the organization. Examples of measures include the amount of time it takes to satisfy a customer's service needs from time of

identification of a need to satisfaction of the need, or the amount of time a customer must wait in line for service.

(4) Learning and Growth Measures. These are measures of the capability of an organization's employees to carry the organization successfully into the future. Examples of measures include employee satisfaction or employee's current level of skills versus skills that will be required to meet customers' needs.

3. Strategic Management Application

Following up their initial work, Kaplan and Norton emphasized the use of the balanced scorecard as a Strategic Management System [Ref. 8]. Kaplan and Norton found that the process of creating a balanced scorecard forces senior management of an organization to determine the critical objectives and performance measures to be included. This "strategic" information should provide guidance for the organization's future. Furthermore they detailed four helpful strategic management processes, which should be introduced during the development of the organization's balanced scorecard.

a. *Four Helpful Strategic Management Processes. [Ref.8]*

(1) Translating the Vision. This is the clarification of the organization's vision and strategy. An organization's vision can be defined as its ultimate objective. From this vision an all-encompassing vision statement is written that should explain the reason for the organization's existence. How an organization reaches this vision is its strategy. Senior management, while developing the balanced scorecard, must agree upon the vision and strategy. The vision will provide a clear picture of the

organization's purpose and the strategy will contain useful guidance for achievement of defined objectives throughout all levels of the organization.

(2) Communicating and Linking. This involves organization-wide dissemination of the balanced scorecard's strategic objectives and measures. All members of the organization should have access to this information. Feedback from all levels should also be encouraged to allow for increased buy-in, future strategies and inspire local efforts that support the vision.

(3) Business Planning. This process allows organizations to coordinate their business plans with their financial plans. Organizations undergoing business process changes in multiple areas can be difficult for senior managers to keep on track towards common strategic goals. The balanced scorecard objectives can help through prioritizing strategic goals and matching resources to the most strategic projects.

(4) Feedback and Learning. The balanced scorecard is employed as a tool to periodically analyze the current strategy by looking at short term results in all four of the performance measure areas and providing feedback for future changes. Such "learning organizations" have the advantage of not being static and constantly looking for ways to improve.

4. Problems With the Balanced Scorecard

a. *Arthur M. Scheiderman's Findings*

Although the interest and use of the balanced scorecard in general or as strategic management tools have significantly increased, the concept is not without its problems. Prior to Norton and Kaplan's introduction of a balanced scorecard, Arthur

M. Schneiderman developed and used a similar concept, the corporate scorecard, in 1987 while Vice-President of Quality and Productivity at Analog Devices, Inc. Over the years he has witnessed the use and misuse of the balance scorecard in many organizations and has offered the following six reasons for failure of it as a strategic management tool [Ref. 12].

1. Nonfinancial measures are incorrectly identified as the primary drivers of future stakeholder satisfaction.
2. The metrics are poorly designed.
3. Improvement goals are negotiated rather than based on stakeholder requirements, fundamental process limits, and improvement process capabilities.
4. No deployment system that breaks high level goals down to the sub-process level where actual improvement activities reside.
5. A state of the art improvement system is not used.
6. There is not and can not be a quantitative linkage between nonfinancial and expected financial results.

5. Unit Manager Evaluation Tool

Kaplan and Norton have asserted that individual business units of an organization should develop and use unique balance scorecards and that the managers of each of these units should be evaluated based on these unique scorecards [Ref. 2]. But a recent study [Ref. 9] showed, given a choice between unique and common performance measures from which to judge business unit managers' performance, evaluators usually select only the common measures to base their evaluations on. This would seem to decrease the value of individual business unit balance scorecards because unit managers would not

have a reason to include unique performance measures in their future unit balanced scorecards.

6. Balanced Scorecard and Healthcare Organizations

Is the balanced scorecard applicable to healthcare organizations such as the Naval Dental Center in Pearl Harbor? As a service organization it would seem so. The Dental Center, like most healthcare organizations, historically has used performance measures similar to the structure of balance scorecard because of the nature of the service provided. Customers (patients) drive all actions and must be satisfied with their service (treatment and outcome) or their health will be endangered. Patient care and business processes must be designed to meet the needs of the patients with an eye on financial considerations. Lastly, most staff personnel require regular training and education to maintain professional standards and licenses.

Other evidence of its applicability follows. The balance scorecard has been advocated for use in healthcare organizations as both a "framework for driving performance" [Ref. 13] and/or "a tool for energizing and focusing management" [Ref.14]. An example of a healthcare organization that is currently using balanced scorecard is the Calgary Regional Health Authority (CRHA)[Ref. 15]. It is a system of three hospitals and two medical centers, employs over 11,500 staff and includes 2,000 inpatient beds.

CRHA's management team adapted Kaplan and Norton's balanced scorecard ideas to their organization as seen in their Business Plan 2000-2003. The four key macro-areas included are Patients and Clients, Innovative Delivery System, People and Partners, and Financial Accountability. Table 2.1 displays CRHA's four key perspectives:

Patients and Clients	Looks at the organization through the eyes and experience of the people we serve.
Innovative Delivery System	Looks at the quality and effectiveness of service delivery and internal processes.
People and Partners	Looks at what the organization must learn and change to be successful in the future from the perspective of our people and partners.
Financial Accountability	Looks at the organization from a financial and accountability perspective.

Table 2.1 CHRA Scorecard Key Perspectives. After Ref. [15]

CRHA's balanced scorecard is shown in the following figure.

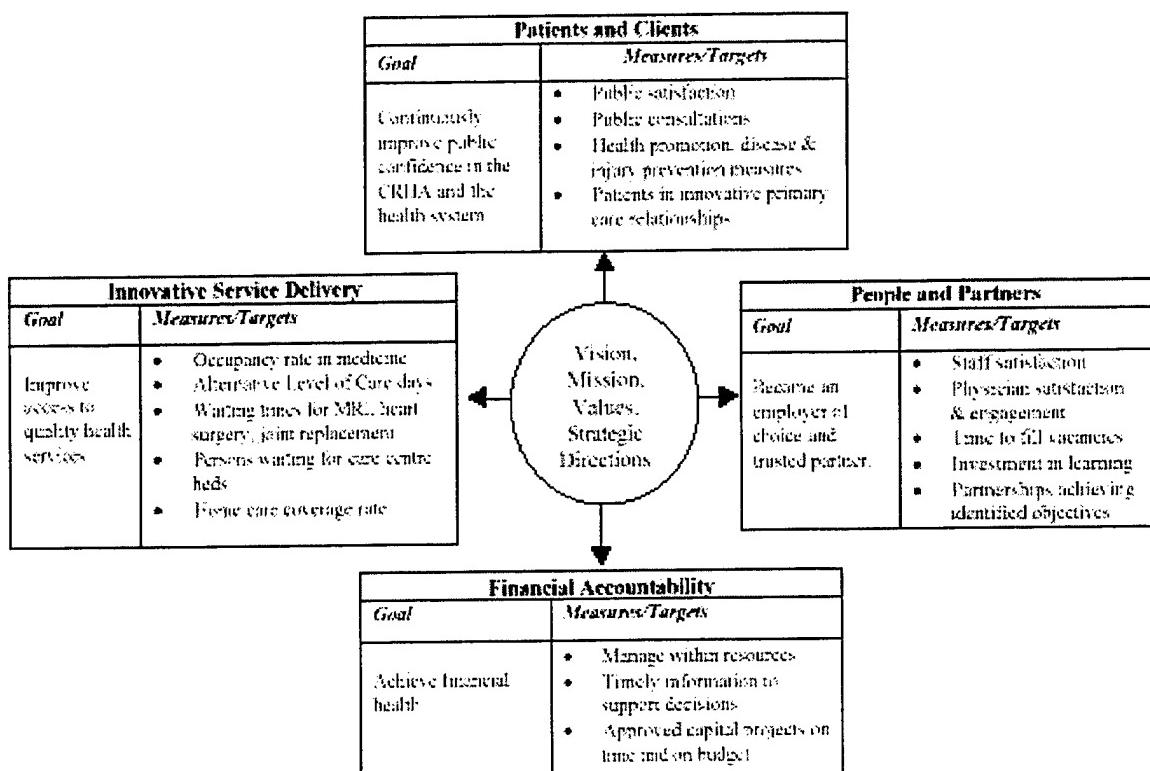


Figure 2.1. CRHA's Business Plan 2000-2003 Balanced Scorecard. From Ref. [15]

The Naval Dental Center Pearl Harbor, significantly smaller than the CRHA but similar as a healthcare service organization, should be able to develop a balanced scorecard that is similar to the one used by CRHA.

B. GOVERNMENT PERFORMANCE RESULTS ACT

In spring 1993, President Clinton announced that Vice-President Gore would head the undertaking of a six-month National Performance Review of all government agencies [Ref. 16]. The goal of this initiative was to create a government that "works better, costs less, and gets results Americans care about." Congress, which had been working on a similar efforts aimed at improving government, put forth a bill that became Public Law 103-62 in August 1993 entitled the Government Performance and Results Act of 1993 (GPRA)[Ref. 3]. These two high-level events were indicative of the government's serious interest in restoring the public's faith in its abilities. The important features of GPRA that are relevant to this thesis will be summarized next.

1. Section 2

This section of the act states that Federal agencies: will be systematically held accountable for achieving program results; set program goals, measure program performance against those goals, and report publicly on their progress; promote a new focus on results, service quality, and customer satisfaction; and improve service delivery. It requires Federal managers to plan for meeting program objectives by giving them feedback on program results and service quality.

2. Section 3

This section of the act states that Federal agencies need to develop a five-year

strategic plan with: a comprehensive mission statement; general goals and objectives; description of how these goals and objectives are to be reached (including resources required; and identification of key factors external to the agency and beyond its control that could significantly affect its achievement of its goals.

In summary the act requires Federal agencies to improve their performance through developing strategic (long-term) plans, clarify their mission, set goals and objectives, and be able to show that they are progressing towards their goals. These goals must focus on results, service quality, and customer satisfaction. Although the act was designed for Federal agencies, subordinate components of the agencies will have to follow similar requirements. In essence The Naval Dental Center Pearl Harbor will be affected by it.

C. HAWAII STATE AWARD OF EXCELLENCE

1. Establishment

The Hawaii Chamber of Commerce established the Hawaii State Award of Excellence (HSAE) to recognize organizations in Hawaii that have demonstrated superior management and performance [Ref. 17]. The award is one of forty-two programs based on the Malcolm Baldridge National Quality Award [Ref. 18] among all fifty states. Organizations interested in recognition and outside review of their management and performance, voluntarily perform a documented self-assessment, and submit it along with an application to HSAE for review. If the submission is rated favorably, a team of HSAE evaluators will undertake a site visit for a more in-depth evaluation and validation of the self-assessment document. If the document is validated and a certain threshold of points reached the organization can be presented with the HSAE. The HSAE uses the same

criteria for evaluation as is used for the Malcolm Baldridge National Quality Award, which will be now examined.

2. Origin

Public Law 100-17, known as the Malcolm Baldridge National Quality Improvement Act of 1987, resulted in the Malcolm Baldridge National Quality Award. The purpose of this law and award was to stimulate private industry to improve its productivity and output quality by improving its management, otherwise the United States might fall behind its global marketplace competitors.[Ref. 4]

Some examples of past winners of the Malcolm Baldridge National Quality Award include Xerox, Cadillac, Motorola, and Federal Express.

3. Award Criteria

The criterion for winning the performance excellence award was established by the National Institute for Standards and Technology (NIST) [Ref. 19]. The following is a list from NIST of the seven main areas assessed with a brief overview of specific items that are examined:

Leadership: The company's leadership system, values, expectations, and public responsibilities.

Strategic Planning: The effectiveness of strategic and business planning and deployment of plans, with a strong focus on customer and operational performance requirements.

Customer and Market Focus: How the company determines customer and market requirements and expectations, enhances relationships with customers, and determines their satisfaction.

Information and Analysis: The effectiveness of information collection and analysis to support customer-driven performance excellence and marketplace success.

Human Resource Focus: The success of efforts to realize full potential of the work force to create a high performance organization.

Process Management: The effectiveness of systems and processes for assuring the quality of products and services.

Business Results: Performance results, trends, comparison to competitors in key business areas-customer satisfaction, financial and marketplace, human resources, suppliers and partners, and operations.

D. NDCPH HSAE APPLICATION WITH SELF-ASSESSMENT DOCUMENT

The Naval Dental Center Pearl Harbor's quest for outside review of its organizational management and performance and consideration for the Hawaii State Award of Excellence began with the completion and filing of an application and self-assessment document. The document, 56 pages in length and complete with charts, tables and graphs, explicitly demonstrated how well NDCPH met each of the criteria as an organization. This self-assessment document is the focus of this thesis and will be thoroughly reviewed in the following chapters.

E. SUMMARY

This chapter provided a general literature review of the key ideas that will be addressed in this thesis. The origin of the balanced scorecard concept and its major components were discussed and the concept was shown to be adaptable to healthcare organizations. The importance of the government's efforts to improve its services, like those provided by the Naval Dental Center Pearl Harbor, was reviewed through the GPRA. Government efforts, both state and national, to improve private industry and not-for-profit service providers was shown through the HSAE and Malcolm Baldrige National Quality Improvement Act review. Finally, a brief description of the Naval Dental Center Pearl Harbor's HSAE application was presented.

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III. METHODOLOGY

This thesis is intended to show how a generic Balanced Scorecard model, applicable to all Navy Dental Centers, could be developed from objectives and performance measures in use at NDCPH, recipient of the 1998 Hawaii State Award of Excellence. The methodology to accomplish this will be explained. Please note that metrics and measures are to be considered synonymous in this thesis.

Although Kaplan and Norton emphasized that each business unit in a very large organization create its own Balanced Scorecard [Ref. 2], for the purposes of this thesis, NDCPH will be treated as one business unit because it is a relatively small organization, (business unit) within a larger organization-the Navy Bureau of Medicine and Surgery (BUMED).

A. LITERATURE SEARCH

In order to increase the author's and readers' knowledge and insight on the relevant topics, a search was conducted for literature and information about the Balanced Scorecard (BSC) concept, the Government Performance Results Act (GPRA), and the Hawaii State Award of Excellence (HSAE). This search included books, texts, articles, the Internet and e-mail.

Robert S. Kaplan and David P. Norton, credited with developing the Balanced Scorecard, provided the majority of the information on it through a series of articles in the Harvard Business Review and their book *The Balanced Scorecard: Translating Strategy into Action*. Information from other articles supporting or criticizing the BSC were found to be helpful. Another interesting source of information came from numerous Websites on the Internet, including government focused, and dedicated to the BSC idea.

GPRA, a public law, was available from the Congressional Record. Other related information was available from articles and the Internet sites promoting it such as Vice-President Gore's National Performance Review.

Information regarding the HSAE came from e-mails with the Award Administrator, Internet sites, and the NDCPH HSAE self-assessment document. In addition, since the HSAE is based on the Malcolm Baldridge National Quality Award (also a public law), reviewing the Congressional Record on it, and the 1998 award criteria helped significantly in explaining it. The importance of the HSAE is that it can be considered a significant validation of the strategic management, quality, and performance of NDCPH and its performance measures.

B. NDCPH PERFORMANCE MEASURES

The HSAE self-assessment document provided the majority of information on the performance measures. The post-HSAE performance measures and data came from NDCPH archival data, e-mails with NDCPH staff, and from BUMED sources including the Navy Manual of the Medical Department and Navy Dentistry Strategic Plan 2000.

NDCPH's performance measures are the core of this thesis as they will be presented, described and evaluated for potential inclusion in the model BSC for Navy Dental Centers. Determination of potential inclusion of performance metrics in a model BSC was based on how the specific metrics contributed to answering Kaplan and Norton's question for each of the four perspectives, as presented in their initial article on BSC. Also any supporting metric data was analyzed as to its significance and usefulness as a performance measure by comparing it with examples from Kaplan and Norton's

literature and from empirical deduction. The author's personal knowledge gained while serving as NDCPH comptroller added to this analysis.

Since a change in leadership occurred after the HSAE application was submitted, this thesis also intended to examine changes in objectives and performance measures, influenced by the new leadership, and also consider any changes for inclusion in the BSC model.

C. BSC MODEL

Once the metrics to be included in the model BSC were identified, a model BSC for Navy Dental Centers was constructed. Each of the four perspectives was given objectives or targets and names of the corresponding measures.

D. SIMILARITIES BETWEEN BSC, GPRA, AND HSAE

Through the literature research and review, discussion of the each of these, similarities, namely the need for identifying an organization's purpose and output, developing a strategic plan, focusing on customers and quality, establishing goals, and determining ways to measure performance, within the thesis and construction of the model BSC, it is expected that a implicit understanding of the similarities of all three of these will be apparent. A summary of the similarities will be presented in the final chapter.

E. SUMMARY

This chapter revealed the methodology to be followed as this thesis moves towards the development of a model BSC for all Navy Dental Centers. The methodology includes a literature search, a discussion of the NDCPH performance measures and the

identification of BSC metrics, building the BSC model, and finally how the similarity between BSC, GPRA and HSAE will be examined.

IV. ANALYSIS OF PERFORMANCE MEASURES AT NDCPH

BSC's, as previously discussed, are strategic management tools that monitor performance of an organization through financial and nonfinancial measures. Per Kaplan and Norton, the ideal time to determine these measures is during strategy forming activities and the four perspectives from the BSC can provide guidance. The goal of the measures should be to constantly steer the organization towards its vision and mission. NDCPH had done a process similar to this when it developed its vision and mission.

The primary purpose of this thesis is to determine if a generic BSC for Naval Dental activities could be developed. Such a tool could assist in making strategic management decisions. In order to develop the generic BSC, a source of performance measures was needed. NDCPH performance measures will be presented and reviewed as a potential source of performance measures in this thesis for two reasons. First, NDCPH was recognized for achieving and sustaining the highest level of performance of an organization in Hawaii by being awarded the 1998 HSAE. Second, the author was familiar with NDCPH's operations and management having served as the command comptroller from June 1996 to May 1999.

The specific performance measures to be included in the generic BSC will be derived from the HSAE Self-Assessment document and for the period following the HSAE, (Post-HSAE), from archived data. Also metrics instituted or proposed by higher authority (BUMED, DoD, Secretary of the Navy) will be considered. At the end of the description and analysis of each performance measure, a determination of its appropriateness for inclusion in the generic BSC will be made.

A. HSAE SELF-ASSESSMENT DOCUMENT

This fifty-six-page document, constructed by two senior ranking Navy dentists on staff at NDCPH, was part of the application process submitted for consideration in the 1998 HSAE. The information and metric data were collected and adjusted as needed to fit into the self-assessment framework of the HSAE document. The framework for the HSAE document was based on the criteria used in the Malcolm Baldrige National Award. It is important to note that some of the data was being collected prior to the HSAE and regularly reported to Navy Dentistry Corporate Management (Headquarters) or other higher authority. Other data was established for local management reasons and included in the HSAE.

Mentioned previously, the HSAE Self Assessment Document, followed the format of the Malcolm Baldrige Award, having been based upon it. The format required an Organization Overview and seven sections. The sections addressed the following organizational areas: 1.0 Leadership, 2.0 Strategic Planning, 3.0 Customer and Market Focus, 4.0 Information and Analysis, 5.0 Human Resource Development and Management, 6.0 Process Management, and lastly, 7.0 Business Results.

This thesis focused on two areas of the HSAE document, the Organization Overview and Section 7.0 Business Results. A copy of these two areas from the HSAE document is contained in the appendix. Because these two areas provided the majority of the information required, only these two areas were used. However, amplifying or clarifying information was taken from the other sections as needed. Each of the two areas is discussed below.

1. HSAE Organizational Overview

In the Organization Overview, the command's Mission, Vision, Key Success Factors (KSF's) were presented. The Mission, common to all naval dental centers, was derived from corporate headquarters, called the Bureau of Medicine and Surgery (BUMED). The command's senior management board, the Executive Steering Committee (ESC), determined the command Vision and identified the KSF's as the path to achieving it. The ESC is comprised of the CO, XO, Command Master Chief (senior enlisted member of command), Branch Clinic directors, Comptroller and Director of Administration. The NDCPH Vision, Mission and KSF's are discussed next.

a. *Vision*

To be **the** Dental Clinic people want to come to. NDCPH strives to be **the** healthcare organization where patients want to have their treatment done, **the** facility where staff members want to come to work, and **the** command where dental corps personnel actively seek to be stationed.

The bold letters and underlining were done to stress the importance of being "the place" for all three of these groups of people. Therefore NDCPH's management strategy should be geared towards achieving this vision and measurable objectives should be established to reflect this. It is important to note that each dental center can have a different vision.

b. *Mission*

NDCPH's mission is "Dental Readiness". A patient is considered dentally ready if no dental complication is anticipated within one year. Befittingly our motto is "Fit to Bite, Fit to Fight". The concept of readiness is the very essence of why we exist. The result is that fighting forces will be dentally ready to complete their mission. NDCPH gives priority treatment to those individuals that deploy on ships, submarines and aircraft groups. However, shore support personnel regularly rotate to deploying units.

Consequently, every effort is made to keep their dental readiness high as well.

The mission is simple, keep sailors and marines dentally ready for fighting. This is what NDCPH and all Naval Dental Centers should be striving for every day. NDCPH must be able to monitor its performance in this area and should have related measurable objectives. In fact BUMED requires regular dental readiness performance reports from all Naval Dental Centers.

c. KSF's

Dental Health as it is reflected in quality and quantity of treatment provided and dental readiness of personnel.

Our People as they develop both professionally and personally.

Customer Satisfaction by improving access to care and making every effort to "WOW" our customers at every available opportunity.

Facilities by modernizing our facility and equipment thus enabling NDCPH to provide the highest quality services to our customers.

These KSF's were the guidance provided by the ESC to the command to make the Vision a reality. The personnel of the command would need regular measurable feedback to determine if they were heading in the right direction. Again performance measures would be expected to provide direction.

2. HSAE Section 7.0 Business Results

The Business Results section contained charts and graphs of data from the twenty-six metrics used in the HSAE. These metrics were selected because they met the requirements for performance monitoring in five specific areas as outlined in the HSAE. These areas were: 7.1 Customer Satisfaction Results, 7.2 Financial and Marketplace

Results, 7.3 Human Resource Results, 7.4 Supplier and Partner Results, and 7.5 Company Specific Results.

Descriptions of each metric were taken from the HSAE document [Ref. 5], the Navy Manual of the Medical Department [Ref. 22], and the author's personal knowledge as former comptroller at NDCPH. Samples of several of the graphs that were included in the HSAE are shown. Metrics that were still in use before and after the HSAE will be incorporated in the graphs (as available data allowed) for comparison. The time frame of the HSAE data ranged from 1988 (in some cases) to April 1998. Unless relevant, only data from 1995 to 1998 was included.

The HSAE and Post-HSAE data will be identified in the descriptions. Any metrics identified as not part of the HSAE, can be attributed to the change in leadership or a change from the corporate headquarters and would have begun after September 1998. These "new" metrics and data will be discussed later. The metrics will be presented in the groups and order as was in the HSAE document.

*a. **Section 7.1 Customer Satisfaction Results***

The metrics included were designed to determine if the command was meeting the needs of patients or taking steps to meet these needs.

(1) Number of Prophies (Cleanings). This metric, part of the Mandatory-reporting metrics, measured the command's efforts at achieving the objective of providing more of what the customer wanted. Patients indicated in past surveys that they desired more dental prophies, which are teeth cleanings. This prophylactic treatment (hence the term "prophies") is usually scheduled once a year. NDCPH responded by increasing availability of this service.

The metric is the average number of prophies per month in a fiscal year (October through the following September) and is shown in Figure 4.1. The difference between the monthly average for FY98 and FY99 is about 65, which if multiplied by 12 months equals 780 more treatments in FY99. This is an increase of about 6.4%. There was no benchmark or information to indicate the overall significance of this measure. A better measure of prophy treatments would be the percent of population that had received at least one cleaning in the current FY. The author will include an improved metric in a "Customer Service" related perspective.

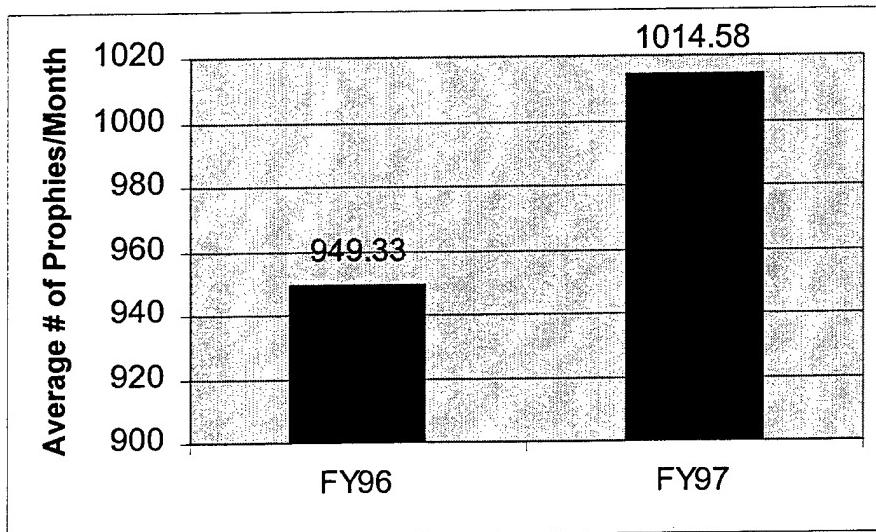


Figure 4.1 Average Number of Prophies per Month. After Ref. [5]

(2) Patient Perception of Services. This NDCPH established metric was monitored through data from regular patient satisfaction surveys and indicated how the command's objective of improving dental services was working. The average annual percent of positive responses by surveyed patients to care received was tracked. Corresponding Post-HSAE data was not available. Figure 4.2 shows a lower percent of positive responses from FY91-93 due to a change in summary reporting. The percent of

positive responses from FY95-97 were high and stable. A new satisfaction survey was being developed in FY98 and results were not available. A patient satisfaction survey will have to be included in a "Customer Service" related perspective of the model BSC.

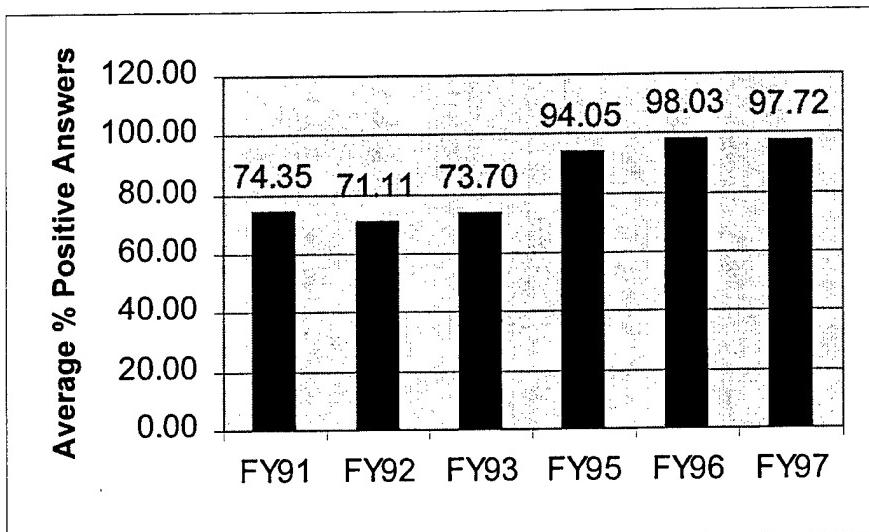


Figure 4.2 Patient Satisfaction With Services After Ref. [5]

(3) Patient's Perception of Access to Care. Another NDCPH established metric, this annual survey of patients was conducted to reveal how these customers feel about their ability to receive care in a timely manner, which was NDCPH's objective. The percent of positive responses to questions about access to care was tracked. A similar metric became mandatory in FY99 and will be discussed in the Post-HSAE section. It is expected that this data will be collected as part of the new Navy Dentistry Patient Satisfaction Survey.

(4) Number of Exams at the Deckplate. The objective was to increase the number of exams away from the fixed dental clinics. This NDCPH established metric was a quarterly report of the number of exams done away from the fixed dental facilities. Alternate dental exam locations included mobile dental vans which

can be set up on the docks and piers in close proximity to ships and submarines or remote land sites, temporary dental offices near active duty personnel work-sites, and finally on deployed ships or submarines by dental personnel placed on the vessels temporarily. This measure shows how dentistry services can be brought to the working personnel (deckplates) versus personnel going to the fixed dental facility.

The biggest advantage to the line commanders is that personnel will miss less work and commands will not have to spend resources on getting personnel to and from the dental facility. The disadvantage to the dental clinic is the expense of dental vans and personnel being pulled from the fixed clinic to provide this service.

Figure 4.3 displays the number of personnel examined outside of the fixed dental facility from FY97Q3 to FY98Q2. A cyclical pattern is seen as the number of deckplate exams decreases from FY97Q3 to FY98Q1 and then increases in FY98Q2. This is due to late summer provider "turnover" gaps, holiday periods and normal ship deployments. This is a measure of improving access (Customer related) and a new process to decrease lost work time so it could be included in an "Internal Business Process" related or "Customer Service" related perspective.

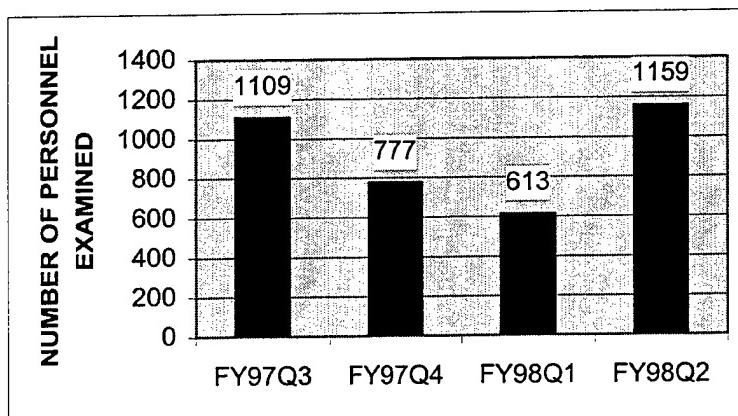


Figure 4.3 Exams at the "Deckplate". After Ref. [5]

(5) Percentage of Employees Receiving Customer Service

Training. An NDCPH established quarterly report showed the command's efforts at the objective of ensuring that employees (active-duty as well as civilian) received formal training in customer service with the intent to improve customer and staff interactions.

Data was collected during the fourth quarter of FY97 and the first quarter of FY98. The percent of employees receiving this training significantly rose from 28% to 77% thus demonstrating the level of importance the command placed on this objective. All staff personnel should be trained in Customer Service. This metric could be included in a "Customer Service" related perspective as it demonstrates efforts to improve how patients "see" the Dental Center, or in a "Learning and Growth" related perspective.

b. *Section 7.2 Financial and Marketplace Results*

In the world of private business, organizations monitor financial and marketplace performance through traditional measures, such as revenue, net income, return on investment, stock price to earnings ratio, etc., which are all related to the amount of goods or services provided to customers. The HSAE criteria required that NDCPH include financial and marketplace results. NDCPH, like all Government entities, could not measure its output in the same way as private firms. NDCPH (and all DOD dental centers) did have a primary output and it was called dental readiness. For the sake of the HSAE, NDCPH indicated that measurements of dental readiness would be interpreted as marketplace results (getting needy patients in the door and improving overall readiness) and production would be interpreted as a vehicle to compete with other naval dental facilities for personnel and resources (production changes indicating a need).

(1) Operational Dental Readiness (ODR)-Percentage of Fleet

Units Leaving Pearl Harbor at 100% Operational Dental Readiness (ODR). ODR is the measure of personnel (percent) in either Dental Class 1 or 2 from a particular unit all the way up to the entire Navy. These personnel are considered operationally dentally ready. The importance of this measurement is that these personnel should not require emergency dental care within the upcoming year [Ref. 22] or more importantly while deployed.

Therefore, since most vessels do not have advanced dental treatment capability, the units' missions should have less chance of disruption from dental problems. NDCPH's objective was to ensure that all vessels deployed from Pearl Harbor with only dental Class 1 or 2 personnel onboard. This NDCPH established metric utilized mandatory reporting data. It was an annual percentage of deploying units with personnel at 100% ODR. Figure 4.4 below shows NDCPH's focused efforts on this objective in FY98 when 100% ODR was reached by all deploying units. This metric, will be included in a "Financial Measure" (output) related perspective. It has been benchmarked at 100%, set by the Head of DoD (Health Affairs), a major stakeholder for Navy Dentistry.

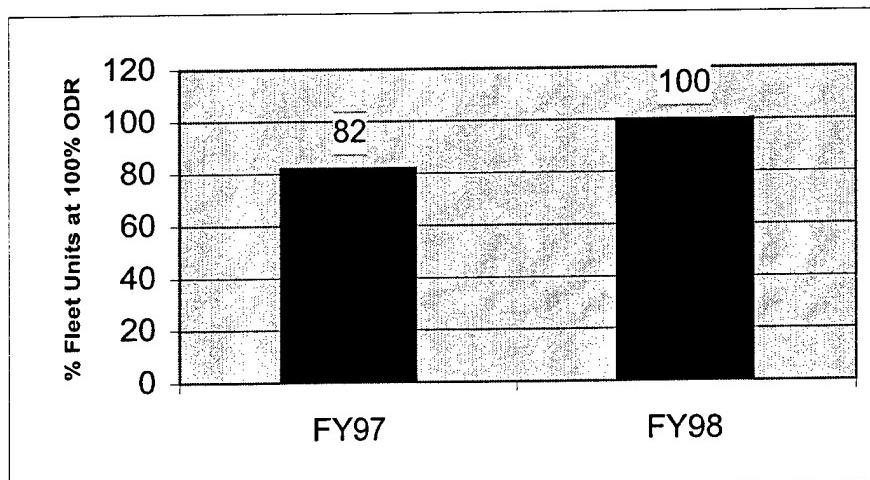


Figure 4.4 **Fleet Operational Dental Readiness.** After Ref. [5]

(2) ODR-Average Readiness/Month. The objective was to strive for all active duty sailors and Marines to be Class one or two (dentally ready to deploy). This is similar to the above metric but it is an average percent of all active duty Navy and Marine personnel that fall under the responsibility of NDCPH. Two years of HSAE and two years Post-HSAE data (CY98-99) are presented in Figure 4.5. A steady increase in this measure can be seen in the first three years of data. Corrections to the data collection and reporting in CY98 resulted in a slight decrease. The percentage increased again in CY99. In 1998, NDCPH set a stretch goal of 95% ODR up from 85% a figure arbitrarily set by the Secretary of the Navy in the same year. This data was extracted from mandatory reporting data. This measure could be combined with the above metric to form one metric. It could then be included in a "Financial Measures" related perspective as a measure of output. It has a benchmark set by DoD(HA) of 95%.

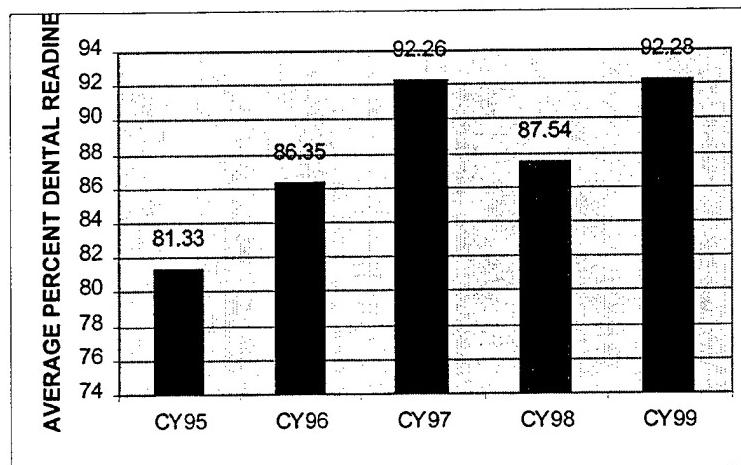


Figure 4.5 ODR Average Per Month. After Ref. [5]

(3) Percent of Personnel in Class 1 Status (DHI). Also known as the Dental Health Index (DHI), the objective was to continuously strive to increase this index. These patients are considered to be in the ideal state of dental health because no

treatment is required or anticipated during the next twelve months [Ref. 22]. Figure 4.6 shows a steady increase in this metric over a nine-month period towards the Department of the Navy's (DON) goal of 47%, set in FY2000.

HSAE data was estimated from a graph but still should be considered reliable. Post-HSAE data is from December 98 and March 99. This data was extracted from mandatory reporting data. This metric will be included in a "Financial Measures" related perspective because of the DON goal and as it is the only measure of the percent of "Dentally Healthy Sailors and Marines", which is Navy Dentistry's Vision as stated in its Strategic Plan 2000.

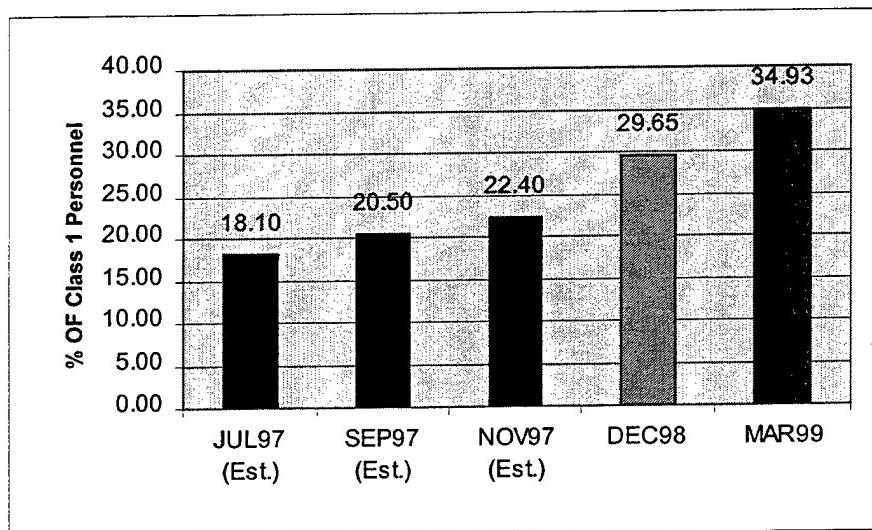


Figure 4.6 Percent of Class 1 Personnel. After Ref. [5]

(4) Percentage of Appointments to Class 3 Dental Patients. The objective was to target this neediest class of personnel. It was a monthly percentage of all appointments filled by Class 3 patients, who have dental conditions that have potential to require emergency care within twelve months [Ref. 22], and therefore are a risk to their unit's mission. This data was extracted from mandatory reporting data. This metric could

be included in either an "Internal Business Process" related perspective because it relates to efforts to get these patients into the Dental System, or in a "Customer Service" related perspective as it meets patients' needs.

(5) Recall Compliance. This NDCPH established metric was a monthly percent of personnel who had not responded to notices from NDCPH regarding the need to make a dental appointment. The objective was to decrease this percent. NDCPH used this data to focus on certain commands or personnel. Via a succession of contacts, from the lowest level of command and rising as far as needed, the personnel were persuaded to report to the clinic. A graph was not presented due to incomplete data.

(6) Production (Number of Procedures). NDCPH set up this metric to track the total number of procedures performed by NDCPH in a year. The objective being measured was to ensure NDCPH was as productive as possible but this could not be determined from the data. Combining the patient population or number of dentists onboard with this measure would have made more sense as a measure of production or output. Figure 4.7 shows a significant downward trend in the number of procedures. Changes in population served and reporting methods contributed to the drop. This data was extracted from mandatory reporting data and was estimated from a graph. An improved metric, developed by Navy Dentistry Headquarters, will be included in a "Financial Measures" related perspective. Figure 4.7 is shown on the next page.

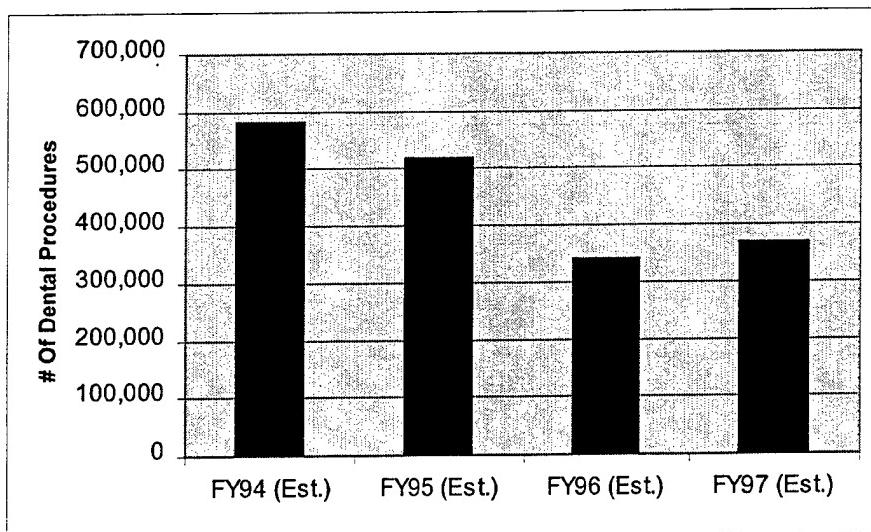


Figure 4.7 Production (Number of Procedures). After Ref. [5]

(7) Number of Failures. This monthly NDCPH established metric was the total number of appointments not kept and therefore indicated a measure of opportunities lost to treat patients, improve readiness and man-hours spent trying to contact and reschedule these people. The objective was to reduce this number. Efforts to do so included providing appointment cards and contacting a command representative the day before the appointment.

c. 7.3 Human Resources Results

NDCPH is committed to promoting its employees' professional and personal development. These metrics should provide evidence of such.

(1) Internal Customer (Staff) Satisfaction. The objective was to determine the command's working climate. This mandatory annual survey (printed), called the Command Assessment Survey, was given to all employees. Individuals responded to a series of questions using a sliding scale scoring system. Results were to be kept confidential. The annual average of four key areas of the survey, Advancement

Opportunities, Discipline, Grievances, and Fraternization, was included in the HSAE. A similar staff satisfaction survey is to be started by Navy Dentistry in 2001. This survey will be included in a "Learning and Growth" related perspective..

(2) Advancement Test Score Improvement. This NDCPH established metric was to track enlisted advancement test scores. Eligible enlisted personnel participate in Navy-wide biannual advancement tests up to the Chief Petty Officer (E-7) level. This metric could be used in conjunction with the next metric to determine effectiveness of command programs to help enlisted staff improve their scores.

Post-HSAE data began in March 1998. A review of the data in Figure 4.8, shows that high test scoring individuals in the E-4 test population, who boosted the average scores, would expect to boost the E-5 test scores in one year and the E-6 test scores in three years due to minimum time in grade requirements. Advancement examination test scores are strongly dependent on test-takers personal desires to succeed therefore this metric will not included in any of the perspectives.

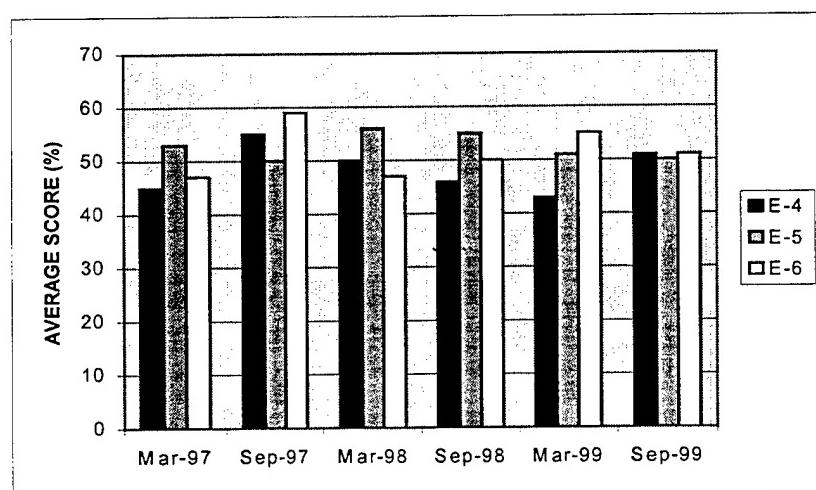


Figure 4.8 **Advancement Test Score Improvement.** After Ref. [5]

(3) Hours Volunteered for Lunch and Learn Program. The objective was to ensure enlisted personnel were given assistance in advancement opportunities. This NDCPH established metric tracked the quarterly total number of hours volunteered by senior enlisted and officers to assist in lunchtime enlisted advancement exam preparation. Figure 4.9 displays the data and can be contrasted to Figure 4.8 Advancement Test Score Improvement to determine if there was a relationship between the number of volunteer “Lunch and Learn” hours and test improvement. A better test of the “Lunch and Learn” program would have been to compare test score averages before the program and afterwards. The spike in FY98Q2 was probably influenced by the outgoing Commanding Officer’s desire to see this program work and the HSAE. Post-HSAE data began in the third quarter (Q3) of Fiscal Year 1998.

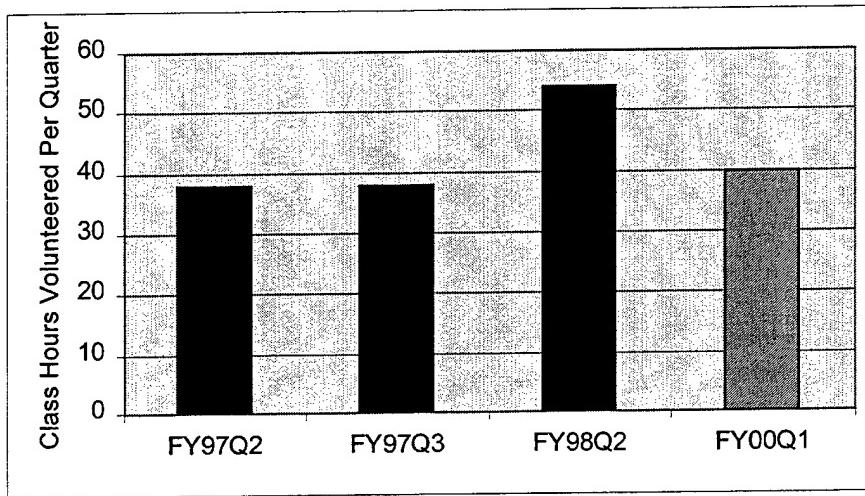


Figure 4.9 **Volunteer Hours for Lunch and Learn.** After Ref. [5]

(4) Number of Personal Awards Presented. The objective was to track the number and type of awards presented by the command to officers, enlisted and civilian staff. This was done to ensure that awards were being fairly distributed among the groups. Personal awards could be medals, letters of commendation,

letters of appreciation or monetary/time-off (civilian) awards. Awards were based on merit and no awards were mandatory. The total number and type of Personal Awards presented to staff enlisted, officer or civilian members was compiled and reported to higher authority. This metric could be included in a "Learning and Growth" related perspective. This data was extracted from mandatory reporting data.

(5) Number of Officer Continuing Education Hours. Although not required, NDCPH strove to provide each dental officer with one command-funded trip for continuing education (CE) purposes per year. The objective was to ensure personnel were given opportunities for professional improvement or obtaining required CE hours to maintain licensure. An annual total of officer CE hours was collected.

Figure 4.10 shows these numbers from FY95 to FY99. The number of ours depends on several factors including number of dentists, availability of discretionary funds and command priorities. The decrease in FY98 and 99 reflect a tightening on available funds not fewer dentists. This measure was not significantly useful because it does not measure whether or not all officers were able to obtain the necessary CE hours, and rank does not always indicate the level of CE hours required annually. Post-HSAE data began in 1998. A related metric proposed by the author was included in the "Learning and Growth" related perspective. Figure 4.10 is shown on the next page.

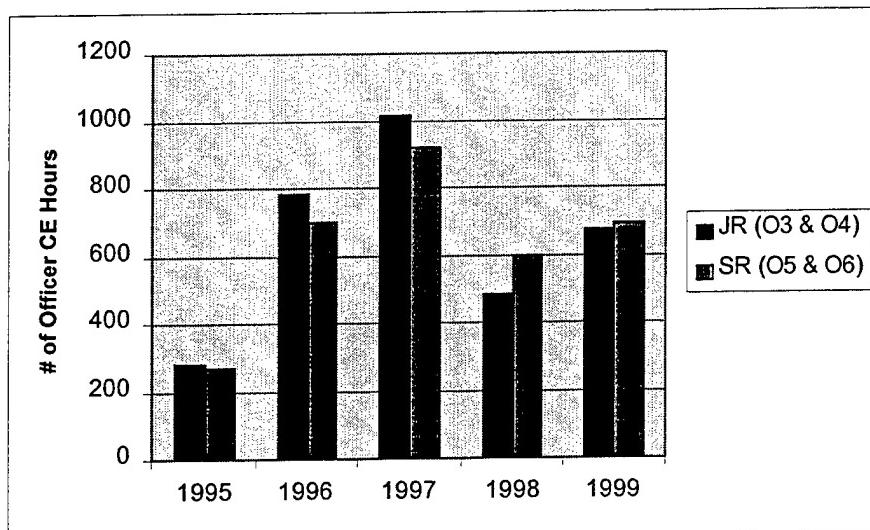


Figure 4.10 Number of Officer CE Hours. After Ref. [5]

(6) Number of Physical Readiness Test Failures. Military staff members are required to participate in a biannual fitness test to demonstrate acceptable levels of endurance, cardiovascular health and flexibility. The command's objective was to track efforts to reduce the number of failures. This data was extracted from mandatory reporting data.

d. 7.4 Supplier and Partner Results

Results of how well NDCPH interacts with partners and suppliers are monitored through the following metrics.

(1) Dental-Medical Recycling Partnership. The Dental and Medical clinics joined together to collect and turn in recyclable material thus reducing the number of trips necessary to deliver recyclable materials (the objective). This NDCPH established metric tracked the total pounds of recyclable materials per quarter that were turned in for recycling.

(2) Supply Order Receipt Time. A NDCPH established metric that provided a quarterly report of the average number of days that were required to process individual routine supply orders by the Fiscal and Supply Department. The timing of the metric began when the Supply Department received the requisition and ended when the ordering department received the material. The objective was to reduce the average supply order-to-receipt time in days, reduce the amount of inventory required, and ensure a steady flow of supplies.

Figure 4.11 illustrates that this objective was successfully being carried out. These results were accomplished through an increased use of the Government Purchase Card, changes in federal regulations, and changes in processes in the Fiscal and Supply departments. There was no Post-HSAE data as this objective was considered met.

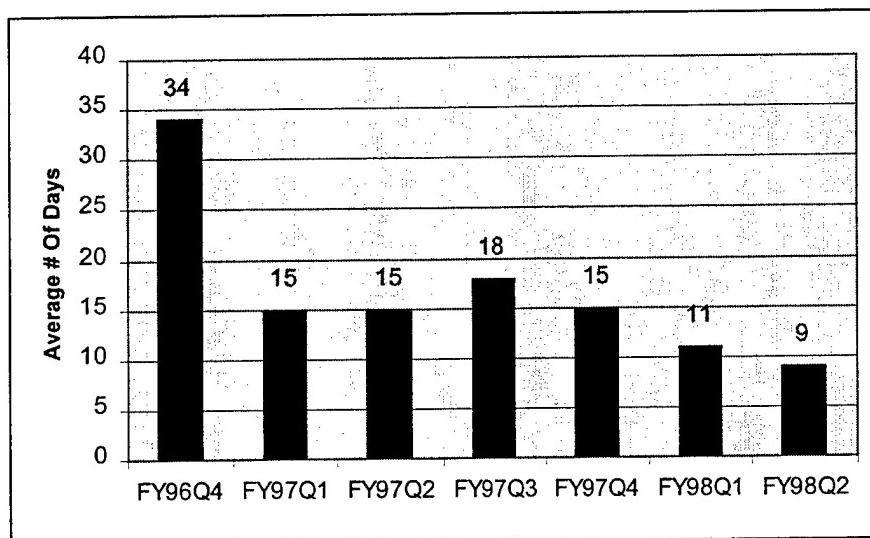


Figure 4.11 Supply-Order-Receipt Time. After Ref. [5]

(3) Government Purchase (Credit) Card Use. The objective was to maximize the use of this purchasing vehicle. An annual total number of supply and service purchases using the Government Purchase Card was collected. Maximal use of

this card was encouraged because of advantages such as greatly reduced supply order receipt time and increased purchase source flexibility. In FY1998, usage became mandatory and this metric became obsolete.

e. **7.5 Company Specific Results**

NDCPH created the following metrics to measure performance in other areas considered important enough to the command and the HSAE award criteria to warrant monitoring.

(1) Man-hours Volunteered by Command Employees. This metric was the annual total number of man-hours volunteered towards helping the command or community. NDCPH combined volunteering and the "Spirit of Aloha" by stressing volunteerism (its objective) in the local community. Figure 4.12 shows the amount of hours volunteered. Both command and community volunteerism by command employees showed major increases as volunteerism was greatly encouraged by command management. This metric could be included in a "Learning and Growth" related metric.

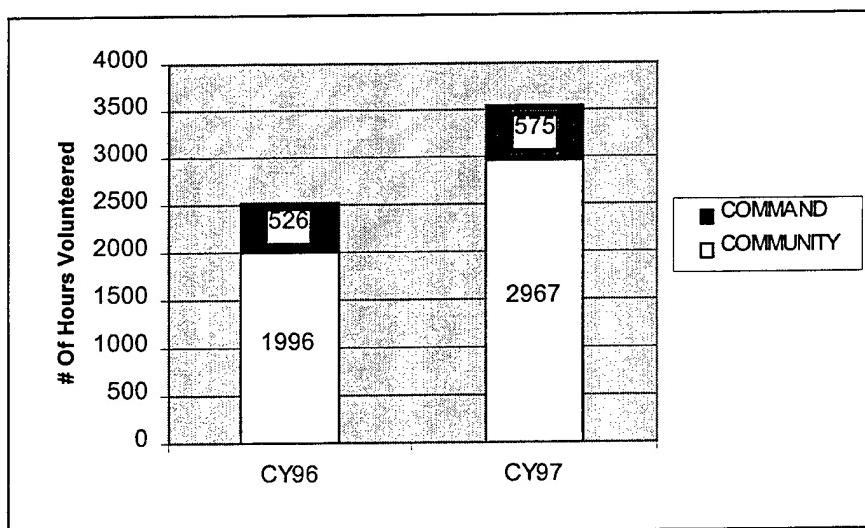


Figure 4.12 **Command Volunteer Hours**. After Ref. [5]

(2) Percent of Employees Volunteering. Similar to the previous metric, this metric broadly monitored employee volunteerism. It is an annual percent of employees who volunteered time and assistance to the community or command.

(3) Plant Maintenance/Upgrade. An annual report of the total amount of command funds spent on plant maintenance and upgrades. Although not an exact measure of efforts to provide employees and customers with desired quality, clean and safe facilities (its objective), it could be considered a reflection of a continuing commitment to do so. A better measure of actual facility upgrade would not include the routine maintenance costs. Figure 4.13 shows significant variation in FY96. Special project funding for specific upgrade requirements was made available by BUMED in FY95 and FY97. FY96 was not necessarily a down year but reflected normal funding for plant maintenance and upgrades. This metric has potential but does not fit Kaplan and Norton's BSC perspectives. Post-HSAE data was not available.

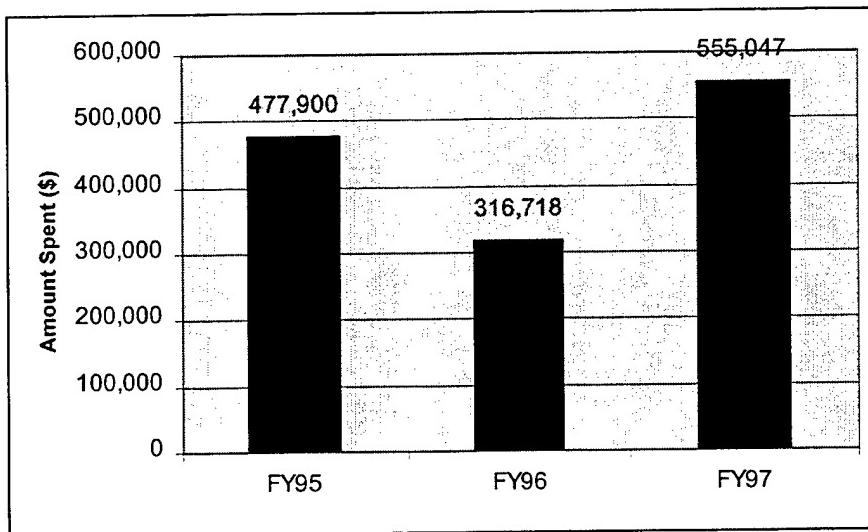


Figure 4.13 **Plant Maintenance/Upgrade Costs.** After Ref. [5]

(4) Status of Plant Projects (% Completion). This metric was designed to ensure that facility improvement efforts did not stall and thereby reduce employee enthusiasm in the workplace (objective). Each project was divided into a series of steps that were assigned a percent of completion. Included in the steps were verification of the project by the Operating Management Officer and CO as a legitimate need, prioritization among other needs, getting an estimated cost, setting aside funds and ending with completion. A total percent of steps from all projects was then tabulated and reported. Like the previous metric, this metric has potential but does not fit Kaplan and Norton's BSC perspectives.

(5) Are Internal Customer Needs Being Met? The Supply and Dental Equipment Repair departments conducted a one-time, joint internal customer satisfaction survey in 1998 for the purposes of the HSAE to determine if they were meeting the internal needs of their customers (objective). These two support teams were selected because they have the most impact of all support teams on patient treatment.

Figure 4.14 illustrates that 54% of customers gave an "outstanding" rating and 98% felt that the Supply and Repair departments were at least "good" at meeting their needs. Further surveys, although potentially useful, were not formally conducted as this survey was specifically performed for the HSAE. Surveys from every department could be a way to gather innovative ideas or redirect efforts therefore this metric could be included in a "Learning and Growth" related perspective.

Figure 4.14 is shown on the next page.

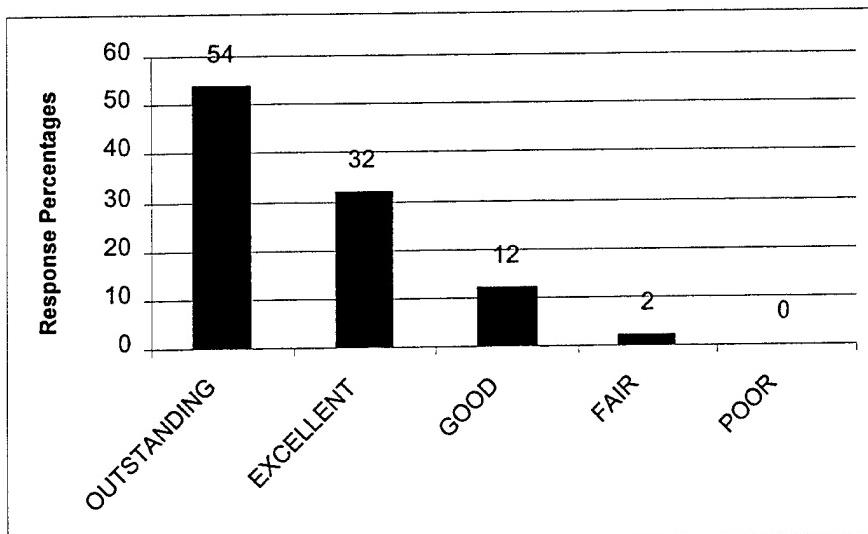


Figure 4.14 Supply & Repair Departments Customer Survey. After Ref. [5]

B. POST-HSAE PERIOD

In August 1998, the leadership of NDCPH changed. This occurred after the submission of the 1998 HSAE application. Any changes in the command Vision, Mission, KSF's or performance measures would have occurred under the new leadership and has the potential to show strategic changes and influences due to the new leadership. Performance metrics differing from the HSAE measures will also be examined for inclusion in a generic BSC.

1. Organizational Overview

The command Mission, Vision and Key Success Factors were not changed significantly from the 1998 HSAE overview. Minor language changes were made in the descriptions of two KSF's to allow them to fit on one line. In the Customer Satisfaction description, the phrase "at every available opportunity" was deleted. The new description is – "by improving access to care and making every effort to "WOW" our customers". In the Facilities KSF description, the phrase "the highest" was deleted. The new description

is - by modernizing our facility and equipment thus enabling NDCPH to provide quality services to our customers. [Ref. 5]

2. Performance Metrics

a. *Mandatory Metrics*

BUMED's Navy Dentistry office developed these metrics and began requiring regular reports from Naval dental activities in FY99. The descriptions are taken from Navy Dentistry Strategic Plan 2000. Examples of available data will be presented.

(1) Class Three Longevity. This metric measures the ability of the dental treatment system to find ways to reduce the number of Class 3 patients, the most "dentally unprepared" personnel. The measure is the percentage of patients per month who have been identified as Class 3, ninety days or more ago, from the total number of patients. The significance of this measurement is that these personnel have dental conditions that if not treated are expected to result in dental emergencies within twelve months [Ref. 22] and therefore the personnel are potentially nondeployable. The objective was to lower this number each month and thus increase total force readiness.

Figure 4.15 shows data collected over the first six months of the start of the metric. As expected the highest percent of Class 3 patients was in the first month of this new metric. As attention and resources are shifted to reducing this number, it decreased to a low of 49.78% in the third month. It increased slightly and continued to do so for the next three months which could indicate a closer scrutiny of all patients for Class 3 indicators or that a change in processes is needed. More time and data would be required to make any determinations on the effectiveness of efforts to reduce this number.

Also a benchmark would need to be established to gauge efforts. Since this measure will indicate the commands efforts to highly prioritize this class of patients it could be included in a "Customer Service" related perspective.

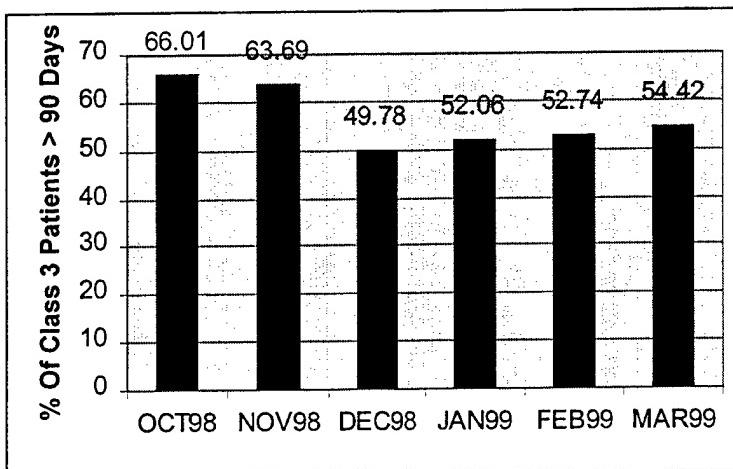


Figure 4.15 Percentage of Class 3 Patients Greater Than 90 Days. After Ref. [5]

(2) Personnel Training. The objective is to ensure personnel are receiving training to maintain licensures or acquire new dentally related skills, techniques, and knowledge that can improve the overall level of dental services provided. The measure, accumulated and reported quarterly, measures the amount of full-time equivalents (FTE) spent by officer, or enlisted personnel in training. One FTE is equal to the annual, reportable number of hours an active duty member is considered on the job or more simply, one FTE equals one body. The training consists of non-readiness training (CEU's, technical training, etc.) and any readiness training required to allow personnel to deploy as needed.

Figure 4.16 shows the results of the first two quarters in FY99. Most training occurs in the second and third quarters of a FY and this explains the difference in the quarters on the graph. The problem with this metric is that it is difficult

to discern what the values on the graph actually mean, are they good or bad? In addition, how is the value to the command of the training determined, and are training opportunities fairly offered to all staff. The author has proposed a similar metric regarding training and could include it in a "Learning and Growth" related perspective.

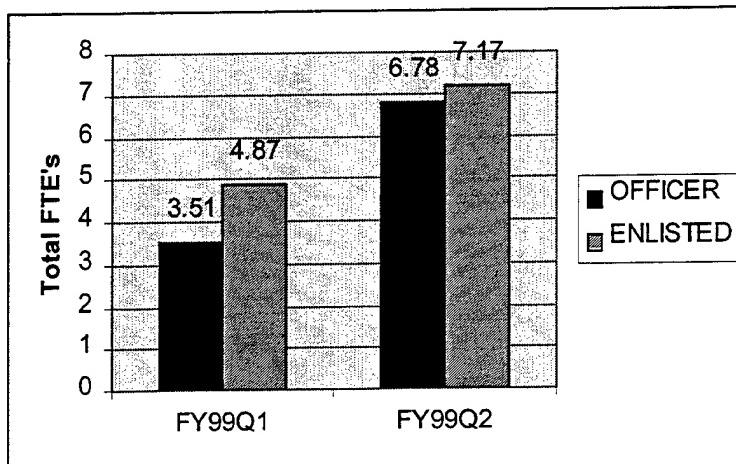


Figure 4.16 Total FTE's Assigned to Training by Quarter. After Ref. [5]

(3) Clinical Production. The objective is to ensure the command is as clinically productive as possible. As explained by BUMED, when utilized, this monthly metric will be the ratio of dental weighted values (DWV) produced or performed per month to the number of FTE's of dental providers available. A DWV is a specific weighted value, as determined by the American Dental Association, assigned to each dental procedure. The DWV directly varies in proportion to the type and complexity of a procedure. Also the higher the DWV of a procedure, the more clinical time (FTEs) should be spent in performing the procedure. But if providers are working inefficiently, fewer DWV's per FTE's will be produced. This metric will be included in the Financial Perspective as it relates directly to productivity. The providers of care (generators of DWVs) can be dentists, dental hygienists or dental assistants (military or civilian).

This metric was not fully instituted so only the total monthly FTEs spent in clinical care by the three categories of providers during the first half of FY99 is presented in Figure 4.17. The number of dentist and dental assistant FTE's vary in direct proportion as the assistants directly support the dentists. The number of hygienist FTE's remains relatively stable because they are either Government employees or under contract and are expected to spend the majority of their time treating patients. All three categories of providers' FTE numbers are strongly influenced by patient failure rates and patient availability (e.g. holiday periods). This metric, if used as intended, could be included in a "Financial Measures" (output) related perspective.

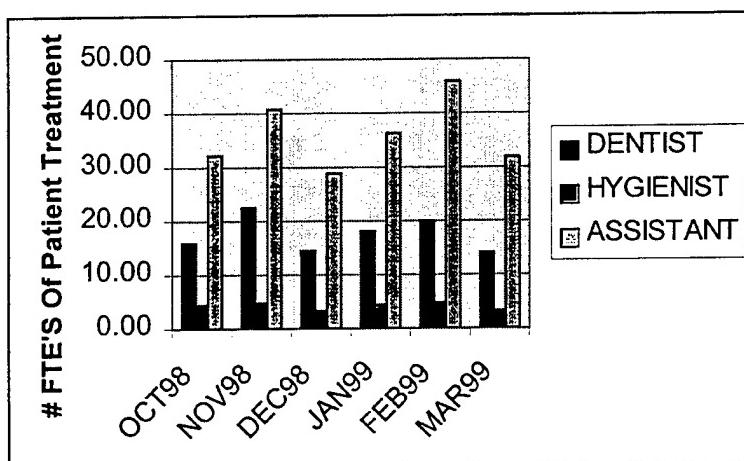


Figure 4.17 Number of FTE's Assigned to Clinical Treatment. After Ref. [5]

(4) Clinical Utilization. This metric is a companion to the previous metric. It is a ratio (percentage) of the time, in FTE's, dentists (military and contract) were involved in clinical treatment (same number as the denominator in the previous metric) per their total reportable time. Reportable time includes the time at work that is not spent in training, travel or other nonclinical activities. This measure shows how well dentists were able to utilize their reportable work time in actual patient treatment. The

objective, set by BUMED in FY99 is 70% for military dentists and 90% for contract dentists.

Figure 4.18 indicates that NDCPH was consistently below the target set by BUMED during the first six months of FY99. More time and data will be needed to adequately judge NDCPH's performance. Since there is an established benchmark and it is a measure of effective use of clinical time, this metric could be included in a "Internal Business Processes" related perspective as it is an efficiency ratio.

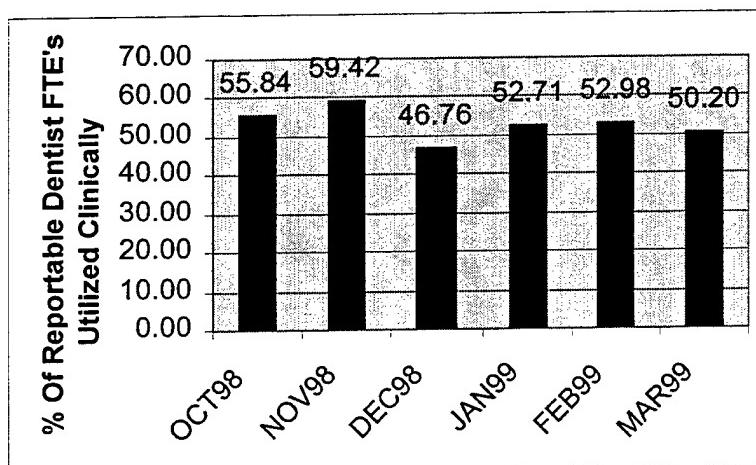


Figure 4.18 Percentage of Dentist FTE's Used Clinically. After Ref. [5]

(5) Access to Care. Patients (customers) cite lack of access to dental care when it was most convenient for them as a major source of dissatisfaction. BUMED established a goal of ensuring that every patient was given a choice of at least three different appointment dates/times within the next twenty-one days. Each specific department or branch clinic had to report, quarterly, whether or not it could meet this requirement. A graph was not practical to present. The new Patient Satisfaction Survey should provide relevant data for a "Customer Service" related perspective.

b. NDCPH Established Metrics

The following metrics were established after the HSAE and change in command leadership and should reflect new strategic influences. They are in no particular order of priority or importance.

(1) Command Income (Revenue). The metric is similar to measuring productivity or output. The objective as in any corporation is to maximize revenue and hopefully income. Military dental facilities often treat non-DOD patients such as NATO forces and United States Coast Guard members. Reimbursement rates (dollar values) per procedure have been established to allow these facilities to be reimbursed for treatment provided. This is similar to revenue not income in the private sector.

The CO of NDCPH expanded upon this concept of placing monetary values on procedures to approximate how much revenue the clinic was theoretically producing. The total value of procedures was called command or corporate income, although the term revenue should have been used. Clinics, departments and even providers could get a tangible estimate of the value of their work and productivity. Patients could also be told of the value of the services (benefit) provided to them.

This metric data could be presented by month, quarter or FY and upper and lower control limits could be added to help in analyzing the data. Figure 4.19 displays the command income per FY. An increase in command revenue and therefore productivity, appears to have been inspired by this metric. Incentives such as increased liberty (time off) were instituted to further increase competition among departments. FY00 revenue was on pace to break the \$10,000,000 level.

The significance of this metric is that it instills a sense of monetary value of services provided by the providers and can even be used to show recipients of care a good approximation of their dental benefits available in military service. This metric, renamed Command Revenue, could be included in a "Financial Measures" related perspective as it ties productivity to financial value.

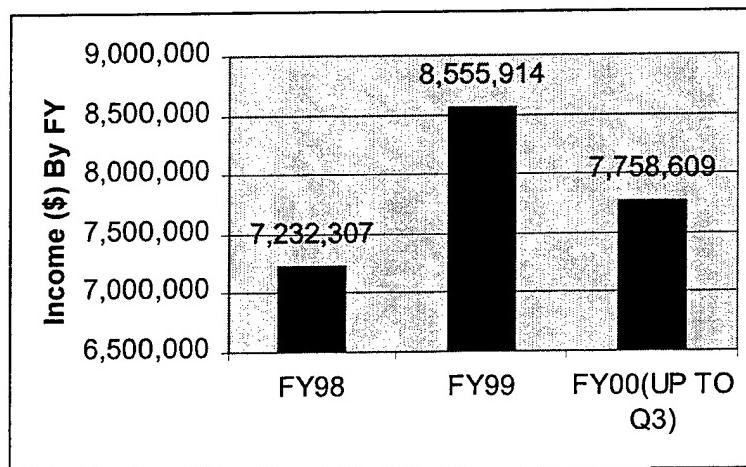


Figure 4.19 **Command (Corporate) Income by FY.** After Ref. [5]

(2) Per Capita Income (Revenue). This metric, begun in January 2000, is determined by dividing the total revenue generated through dental services provided by the total clinical FTE's reported for the same time period. The objective is to maximize the per capita income or income generated by the available staff. Figure 4.20 shows considerable variance that could be due to cyclical events such as staff turnover, deployment of ships, learning curves of new staff, etc. Also it should be noted that a relatively small number of FTE's utilized to perform high value procedures (root canals, oral surgery) will skew the data upwards and in contrast, lower value, high FTE procedures such as routine dental examinations will skew it downward. Due to this variability, Per Capita Income will not be considered as a BSC metric.

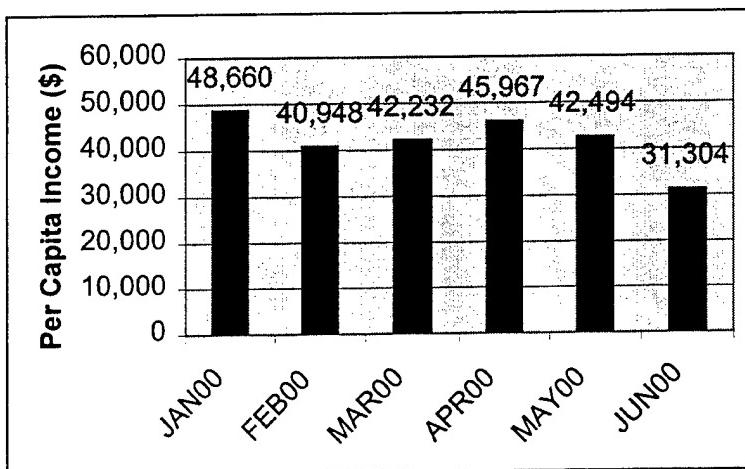


Figure 4.20 Income per Clinical FTE . After Ref. [5]

(3) One-Stop Shopping. This new metric was started to track the percent of prophies done on all patients with exam appointments. Senior management set a strategic objective to schedule prophy treatments in conjunction with all scheduled dental exams. The intent was to reduce multiple trips to the dental clinic and lost work time. Most patients due for annual exams either required or desired a "cleaning". Figure 4.21 shows that NDCPH was able to increase "one-stop shopping" by 17% from FY99 to FY00. This metric could be included in a "Internal Business Processes" related perspective as it tracks improving treatment efficiency, or in a "Customer Service" related perspective as it is a measured response to their needs. Figure 4.21 is shown on the next page.

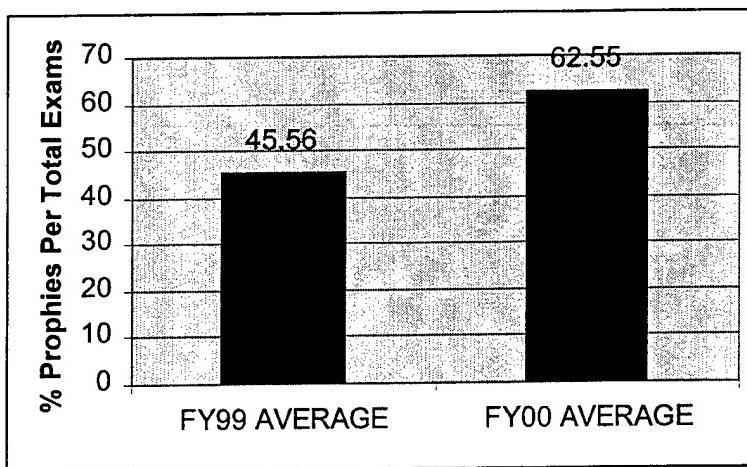


Figure 4.21 Percentage of Prophies Done on all Exam Patients . After Ref. [5]

(4) Comparison of Provider Average Productivity. This is a measure of provider productivity (DWV/FTE) comparing output measures resulting from providers utilizing a new concept called "Expanded Function operations", and output from the same number of providers utilizing the normal operating processes. To review, DWVs are weighted values assigned by the American Dental Association to dental procedures. Complicated procedures are weighted more heavily (thus more costly to the payer) and simpler procedures less heavily. Expanded Function was an initiative begun by senior management to determine if provider productivity could be increased by having the provider work multiple treatment chairs (rooms), the standard in private practice, versus the normal military, one-chair (room), one-provider concept. As the provider completes treatment on a patient in one room, he or she moves directly to the adjacent room that has a patient seated and prepared. Meanwhile the previous room is cleaned and filled with another patient. Idle time waiting for an open chair and room cleaning should be dramatically reduced. Coordination of support personnel is critical in ensuring the success of this concept.

Due to space constraints, only a limited number of providers were able to participate in this pilot project. Figure 4.21 shows a dramatic increase in productivity of the providers in the expanded function category. Such data could be used to request funds to modify the clinic to allow more providers to participate. If successful, it could also result in a reduction of providers locally and eventually Navy-wide. This metric could be included in an "Internal Business Processes" related perspective because it measures improvement in treatment efficiency.

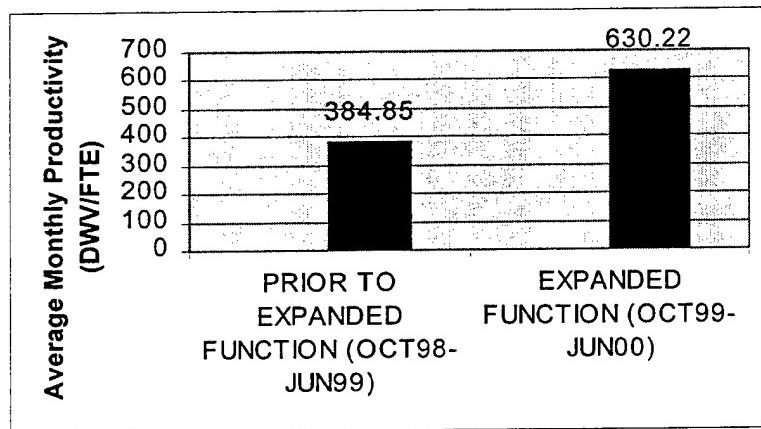


Figure 4.22 Comparison: Provider Average Productivity. After Ref. [5]

C. CHAPTER SUMMARY

This chapter presented the objectives and metrics in use by NDCPH during and after the HSAE period. The sources of information were the HSAE Self-Assessment Document [Ref. 5], NDCPH archives from the Post-HSAE time period and Navy Dentistry strategic plans. Pertinent information about each metric was provided and a determination as to which, if any, of the four BSC perspectives the objectives and metrics should be included in. This information will be utilized in the next chapter to build a model BSC for NDCPH and all Navy Dental activities.

D. SUMMARY OF PERFORMANCE MEASURES

1. HSAE Document-Section 7.0 Business Results

7.1 Customer Satisfaction:

Number of Prophies
Patient Perception of Services
Patient's Perception of Access to Care
Number of Exams at the Deckplate
Percentage of Employees Receiving Customer Service Training

7.2 Financial and Marketplace Results:

Operational Dental Readiness (ODR) Percentage of Fleet Units
Leaving Pearl Harbor at 100% ODR
ODR Average Readiness/Month
Percent of Personnel in Class I Status (DHI)
Percentage of Appointments to Class 3 Patients
Production (Number of Procedures)
Number of Failures

7.3 Human Resources Results:

Internal Customer Satisfaction
Advancement Test Score Improvement
Hours Volunteered for Lunch and Learn
Number of Personal Awards Presented
Number of Officer Continuing Education Hours
Number of Physical Readiness Test Failures

7.4 Supplier and Partner Results:

Dental-Medical Recycling Partnership
Supply Order Receipt Time
Government Purchase Card Use

7.5 Company Specific Results:

Man-hours Volunteered by Command Employees
Percent of Employees Volunteering
Plant Maintenance/Upgrade
Status of Plant Projects (% Completion)
Internal Customers Needs Survey

2. Post HSAE Period

Mandatory Metrics

Class Three Longevity
Personnel Training
Clinical Production
Clinical Utilization
Access to Care

3. NDCPH Established Metrics

Command Income (Revenue) and related measures
Per Capita Income (Revenue)
One-Stop Shopping
Comparison of Provider Average Productivity

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V. BUILDING A PROPOSED FRAMEWORK

As noted in the Literary Review, the primary benefit of using the BSC is that it allows managers a simplified way to regularly evaluate their organization's short term and long-term strategies towards the organization's vision by reviewing data captured through four perspectives. Kaplan and Norton suggested four perspectives; (1) financial, considered a short-term strategy metric (based on historical output); and three long-term strategy forecasters based on operational activities, (2)customer satisfaction, (3) internal processes, and (4) the organization's innovation and improvement efforts.

It is this author's opinion that such a strategic management tool, using a balanced mixture of a short-term strategic measure, and three longer-term operative measures could be useful to governmental service organizations like NDCPH as well as profit-oriented firms, the BSC's original intended target. Therefore the author, in answering the primary research question of this thesis, "How can a Balanced Scorecard model of performance measurement be applied to NDCPH?" will construct a proposed framework for a BSC for NDCPH. The secondary questions will be answered as the framework is built or following its completion.

The BSC must be based on the organization's links between its Vision and Mission and strategies to achieve them. NDCPH's Vision and Mission are linked to its strategies through its Key Success Factors (KSFs) that were defined as the path to NDCPH's Vision in the HSAE document. The Vision can be summarized into "NDCPH being the Navy Dental Clinic of choice for both patients and employees (military and civilian)". The Mission can be summarized into "Dental Readiness" which means getting Sailors and Marines in Dental Class 1 or 2 so they are worldwide deployable.

Fulfilling these KSFs will ensure that the Mission is being accomplished and NDCPH is doing the right things to approach its Vision. The KSFs, developed by NDCPH's strategic management team, the Executive Steering Committee, were (and still are):

Dental Health as it is reflected in quality and quantity of treatment provided and dental readiness of personnel.

Our People as they develop both professionally and personally.

Customer Satisfaction by improving access to care and making every effort to "WOW" our customers at every available opportunity.

Facilities by modernizing our facility and equipment thus enabling NDCPH to provide the highest quality services to our customers.

These four KSFs have similarities to Kaplan and Norton's four perspectives in the following ways. "Dental Health" an output related measure based on historical data, provides a short-term look at how the organization is doing. The three other measures, more related to operational functions, can provide long-term indications of operational success. They are "Our People" (the causes of innovation and recipients of learning), "Customer Satisfaction" (the major drivers of and most affected by organizational activities), and "Facilities" (affects future services provided). Because of these similarities, and the significance of the KSFs as strategic indicators, the KSFs will be considered as the goals to be achieved (perspectives) in the BSC proposed framework. All data examples were derived from Chapter IV.

A. **NDCPH BSC FRAMEWORK**

The perspectives will now be matched up with measures directly drawn from, or generated by ideas from, NDCPH's HSAE and post-HSAE time periods as presented in the previous chapter. The criteria for selection involved the author drawing on personal

experiences while performing comptroller duties at NDCPH as well as knowledge and information acquired while researching the BSC. Each of the measures selected support the perspective (KSF) that it falls under and therefore supports NDCPH's Vision and Mission. The resulting framework, with data examples from Chapter IV, is a proposed NDCPH BSC framework based on this thesis.

1. Dental Health

-as it is reflected in quality and quantity of treatment provided and dental readiness of personnel.

Goal	Measures
Dentally healthy and dentally ready Sailors and Marines.	<ul style="list-style-type: none"> -DHI (% in Class 1 status of all patient population) -ODR (% in Class 1 or Class 2 status of all patient population) -Clinical Productivity (DWV/FTE) -Clinical Utilization (Clinical FTE/Reportable FTE) -Class 3 Longevity (time from identification of a Class 3 patient till appointment scheduled) -Command Revenue

The selected measures are all indicators of NDCPH efforts to raise the level of dental health and readiness of its patients. For example, the "DHI" was increased from 18.10% in FY97 to almost 35% in FY99. In addition Navy Dentistry has set a benchmark of 47% for this metric. "ODR" of deployed fleet units (a subcategory of this metric), measured in percent of units deployed at 100%, rose from 82% in FY97 to 100% in FY98. 100% should be considered the benchmark for this metric.

"Class 3 Longevity", a measure of how well NDCPH is doing to get its most needy patients in for treatment, dropped from 66.01% in October 1999 to 54.42%

in April 2000. A benchmark for this metric should be considerably lower.

"Clinical Production" and "Utilization" will be more useful when applied correctly and with more data collection. "Clinical Utilization" does have a Navy Dentistry benchmark of 70%.

"Command Revenue" shows an approximation of the monetary value of the services provided to military personnel based on fees of services performed by private dentists. It is also is a monetary measure of output. NDCPH produced \$7,232,307 worth of services in FY98. In FY99 it produced \$8,555,914 and was on pace to surpass \$10,000,000 in FY00. This metric also can be used to stimulate a competitive spirit within a dental center and could be used to provide patients an estimate of the significant value of their dental benefits.

2. Our People

-as they develop both professionally and personally.

Goal	Measures
Be the Navy Dental Clinic of choice for Military and Civilian staff.	-Staff satisfaction survey -Personnel training measures -Number and distribution of Personal Awards -Number of innovative ideas piloted or implemented by staff -Staff command and community volunteer opportunities

A "Staff satisfaction survey " should give the best overall assessment of this goal and it is expected that the Navy Dentistry staff satisfaction survey , when initiated, will provide the necessary data. The staff satisfaction data in the HSAE was based on the annual Navy-wide mandatory Command Assessment Survey. This data or similar survey

data would have to somehow be summarized into a score for the entire command in order to work in a BSC. The other measures, "Personnel training measures", "Number and distribution of Personal Awards", "Number of innovative ideas piloted or implemented by staff", and "Staff command and community volunteer opportunities" could support or refute the survey results. For example if an officer states that not enough resources (money or travel time or both) are not provided, a metric displaying measures of these could be offered to dispute or support his claim.

The "Number of innovative ideas piloted or implemented by staff" could be a measure of how the command responds to such ideas, and if positive would be an attractive feature of this command.

An example of "Volunteer opportunities", often a source of personal growth and satisfaction, was seen in the measure Number of Command Volunteer hours. Volunteer hours rose by 1,000 from CY 96 to CY97. These measures would be difficult to benchmark except possibly for "Personnel training" which contains some specific requirements.

3. Customer Satisfaction

-by improving access to care and making every effort to "WOW" our customers at every available opportunity.

Goal	Measures
"Wow" customers with service and access.	<ul style="list-style-type: none">-Customer satisfaction survey-Exams at the "deckplate"-Percent of appointments to Class 3 patients-"One-Stop" shopping

An explanation of how these measures support the goal is as follows. A "Customer satisfaction survey" would be the primary measure of service, access, and quality as perceived by patients. An example of this showed that from FY95 to FY97, 94% or more of the patients surveyed gave positive responses to NDCPH's services.

"Exams at the deckplate" and "One-Stop shopping" are measures of programs initiated to increase access or reduce the number of visits required, issues that are high on patient satisfaction indices. For example the percentage of "One-Stop shopping" visits to NDCPH increased by 17% from FY99 to FY00.

The "Percent of appointments to Class 3 patients" is an excellent indicator of how the dental center is managing this most crucial group of patients. The most recent data in the HSAE document showed that this percentage increased from 7% in September 1997 to 27% in February 1998.

4. Facilities

-by modernizing our facility and equipment thus enabling NDCPH to provide the highest quality services to our customers.

Goal	Measures
Modernize the facility and equipment to provide the highest quality services.	-Value of plant/maintenance upgrades -Status of plant projects (% completed) -Internal satisfaction survey of supply and dental equipment repair services

How the measures support the goal in this perspective will now be addressed. Although not specific enough, the measure "Value of plant/maintenance upgrades" would indicate a command strategic (financial) commitment to modernization. An example from NDCPH data showed that NDCPH increased its expenditures in this area from \$316,718 in FY96 to \$555,047 in FY97. However, this metric needs to separate out the

fixed annual maintenance costs from new work (modernization). As most of the money for modernization is not included in the command's annual allotment, this measure really indicates how well a command is at identifying its needs and convincing BUMED to provide the extra funding.

The measure "Status of projects completed", is designed to show what percentage of completion each project is. This measure was to indicate to the staff that work was indeed moving along and not stagnating as often perceived.

The last measure "Internal satisfaction survey of the supply and dental repair departments", a one-time survey during the HSAE, indicated how staff members felt about services provided by the supply department, which orders and receives new equipment, and the dental equipment repair department, which not only repairs equipment but also can alert users of the need to replace equipment and provide guidance on the what equipment to order. The results of the survey indicated that 98% of the staff rated the departments' services at least "good". Of this 98%, 54% rated it as outstanding and 32% as excellent.

B. CHAPTER SUMMARY

This chapter reviewed Kaplan and Norton's original concept of the BSC. This review included looking at the importance of the organization's vision and mission and their relationship to a BSC, and the use of one financial or output related perspective (short-term indicator) balanced against three operations based perspectives (long term indicators) that dealt with customers, internal processes, and innovation and learning (of staff).

The proposed framework was then completed by matching up selected performance measures from Chapter IV (or developed by the author) with the appropriate perspective (KSF). This resulting framework development, seen in Figure 5.1, answered the primary research question of "How can a Balanced Scorecard model of performance measurement be applied to NDCPH?"

Dental Health	
<i>Goal</i>	<i>Measures</i>
Dentally healthy and dentally ready Sailors and Marines.	-DHI -ODR -Clinical Productivity -Clinical Utilization -Class 3 Longevity -Command Revenue
Mission, Vision, and Key Success Factors	
Facilities	Our People
<i>Goal</i>	<i>Measures</i>
Modernize the facility and equipment to provide the highest quality services.	Be the Navy Dental Clinic of choice for Military and Civilian staff.
-Value of plant/maintenance upgrades -Status of plant projects -Internal satisfaction survey of supply and dental repair departments	-Staff satisfaction survey -Personnel training measures -Number and distribution of personal awards -Number of innovative ideas piloted or implemented by staff -Staff command and community volunteer opportunities
Customer Satisfaction	
<i>Goal</i>	<i>Measures</i>
"Wow" customers with service and access.	-Customer satisfaction survey -Exams at the "deckplate" -Percent of appointments to Class 3 patients -One-Stop shopping

Figure 5.1 Author's Proposed BSC Framework for NDCPH

VI. FINDINGS AND RECOMMENDATIONS

This concluding chapter will address the primary and secondary research questions, discuss potential problems with the BSC, and provide recommendations for further implementation and research in this area.

A. PRIMARY RESEARCH QUESTION

The primary research question "How can a Balanced Scorecard model of performance measurement be applied to NDCPH" was answered in the preceding chapter. The chapter presented the "how" during the development of the Proposed BSC Framework (model) for NDCPH. It is not difficult to construct such a framework for NDCPH because much of the data on mission, vision, KSFs, and performance measures was readily available. Below are additional questions that were addressed by the research.

B. SECONDARY RESEARCH QUESTIONS

Question 1: How can this model be applied to other Naval Dental Center's as a tool for strategic management?

All Naval Dental Centers base their organizational vision and mission on those of higher authority (Navy Dentistry Headquarters). There are also several common mandatory performance measures required by Headquarters. NDCPH's proposed model BSC incorporated these commonalities, along with some locally generated performance measures of outstanding innovations that also could be applicable to other Naval Dental Centers. If the other Naval Dental Centers are already capturing performance data similar to NDCPH's, and most should be because of the common mandatory reporting requirements to Headquarters, then it may be relatively easy to adopt this BSC framework to their organizations. They may have to add or replace performance

measures more suitable to the individual clinics. If the organizations do not have readily available performance data then they would be advised to review the list of references for assistance.

Before any Government organization decides to develop a BSC and specific performance measures it should be noted that an article found on the National Partnership for Reinventing Government website, entitled *Balancing Measures: Best Practices in Performance Management* [Ref. 23], pointed out that Government organizations should use established performance objectives whenever possible in building a BSC. This could speed up the process and decrease the amount of resources (funds and personnel) required.

Question 2: Would this BSC provide evidence of complicity of a Government organization to the GPRA?

A BSC could provide some evidence of complicity to GPRA requirements in that elements of BSC and GPRA are very similar. Both require strategic (long-term) planning, identification mission or purpose, focusing on customers, and setting up ways to evaluate the organization's operations. Performance measures are the key requirements to both BSC and GPRA. Today, many federal government organizations are considering BSC as a means of satisfying GPRA requirements.

Question 3: Who are the customers and stakeholders of performance at NDCPH?

The stakeholders of performance at NDCPH include the unit commanders who are relying on NDCPH to get their personnel dentally ready and maintain this status. This will help to avoid loss of personnel and interruption of the mission due to dental emergencies. The next stakeholders are Navy Dentistry who must continue to

demonstrate to higher authority that Navy Dentistry provides a critical service that could not be done by anyone else as effectively and efficiently. Finally, the American people rely on a healthy and ready Navy to defend United States interests at home and abroad.

Question 4: What performance measures were in place when NDCPH won the Hawaii State Award of Excellence (HSAE) and afterward?

The performance measures in place during the HSAE and afterwards are summarized at the end of Chapter IV. These are rather common across Naval Dentistry or relatively easy to implement.

Question 5: What was the criteria for the HSAE and is there a relationship to the Balanced Scorecard?

The criteria for the HSAE, based on the Malcolm Baldridge National Award criteria, which consisted of an organization self-assessing its performance in seven important areas which were leadership, strategic planning, customer and market focus, information and analysis, human resource development and management, suppliers and partnering, and business results. The relationship to the BSC is that both involve strategic management, customer focus, human resource development and business results (output). The HSAE may be broader in its focus because it applies to profit-oriented organizations, but the program is flexible enough to fit a government services organization such as NDCPH.

Questions 6 and 7: The last two secondary questions "What continuous improvement efforts followed the award and why?" and "What effect did new leadership have on NDCPH's managerial strategy and performance measures?" will be answered simultaneously.

With the arrival of the new Commanding Officer, strategies were enacted to primarily improve on the existing effectiveness and efficiency in the following ways. A

metric to measure the monetary value of services provided was started. This metric could tell the command how valuable all its services were, how much each department or provider had contributed to the overall total, and could tell the patient how valuable his or her treatment was. Productivity as measured by this metric rose significantly and continues to rise, because of the awareness of the importance of the value added by the command to the Navy.

A pilot project of having one dentist provide services in two rooms, called "expanded functions" was begun. The performance metric for this innovation has prompted a dramatic rise in productivity versus the traditional one-room, one dentist, and one patient concept. This is an excellent example of "process reengineering" that improves overall performance without adding new resources.

Lastly, an initiative was begun to implement and track the effectiveness of the "One-Stop Shopping" idea. All patients receiving an examination would also be co-scheduled for a cleaning (prophy). This reduces multiple trips to the dental center as well as lost work-time. The related metric has shown that the percentage of these scheduled appointment types has been increasing. This not only saves service times but also improves the use of patient time for dental related activity.

C. POTENTIAL PROBLEMS WITH THE BSC

In Chapter II, Scheiderman's findings revealed six reasons for failure of BSC as a strategic management tool [Ref. 12]. Utilizing his ideas, the following are examples of potential problems with a BSC used by a Naval Dental Center.

Metrics must be designed to indicate performance towards supporting a particular

perspective (also known as a guiding principle or KSF). This in turn indicates how well an organization is progressing towards its mission and vision. Metrics that do not indicate the significance of the data, such as number of procedures performed or amount of money spent on plant maintenance/upgrade are poorly designed. They can be improved by incorporating them into a ratio or percentage. Examples could be the number of procedures performed per FTE or percent of money spent on modernization out of the total spent on plant maintenance/upgrade. Managers must be able to tell if the data indicates good or bad performance and/or identify trends.

Improvement goals should not be negotiated but must be based on stakeholder requirements and improvement process limits or capabilities. For example, a goal of reaching a certain level of DHI, above a "higher-authority" required level, may be negotiated between Naval Dentistry Headquarters and its Naval Dental Centers. The operational unit commanders, as stakeholders, may be struggling to reach or maintain their ODR requirements, which are not as stringent as DHI. The unit commanders may not be able to allow their personnel the extra time off from mission requirements to go to the dental center as often as required to participate in this DHI goal.

D. RECOMMENDATIONS FOR FURTHER STUDY

1. A follow-up study of a Naval Dental Center's experience using the proposed model BSC would be appropriate. Changes in objectives and metrics either caused by, or causing, changes in strategies should be carefully noted.

2. A comprehensive review of current objectives and performance measures used by Naval Dental Centers, including the mandated ones, to identify common or significantly different objectives and measures.

3. Translate the BSC framework to Naval Medical Activities which have very similar operating characteristics.

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APPENDIX. HAWAII STATE AWARD OF EXCELLENCE EXCERPTS

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ORGANIZATION OVERVIEW

Naval Dental Center, Pearl Harbor (NDCPH) provides the highest quality dental treatment to military personnel in the Pacific theater (area where military operations take place). NDCPH serves Sailors and Marines stationed on ships, submarines, air squadrons as well as all shore stationed support personnel.

NDCPH operates five branch dental clinics, two satellite dental clinics, and one Mobile Dental Unit (MDU). The largest branch dental clinic, located in the Command Headquarters building at Pearl Harbor, treats the majority of patients and provides specialty dental treatment (oral surgery, endodontics, periodontics, etc.) and referral services for the other branch clinics. The next largest branch dental clinic is at Naval Air Station, Barbers Point, while smaller branch dental clinics are located at Camp Smith, Ford Island, and Wahiawa. Satellite clinics are located at the Branch Medical Clinic in the Naval Shipyard and the Pacific Missile Range Facility, Barking Sands (Kauai). One dentist operates the Mobile Dental Unit. Approximately 128 command members at the aforementioned locations provide services to more than 18,000 personnel.

NDCPH Mission

NDCPH's mission is "Dental Readiness." A patient is considered "dentally ready" if no dental complication is anticipated within one year. Befittingly, our motto is "Fit to Bite, Fit to Fight". The concept of readiness is the very essence of why we exist. The result is that fighting forces will be "dentally ready" to complete their mission. NDCPH gives priority treatment for those individuals that deploy on ships, submarines and aircraft groups. However, shore support personnel regularly rotate to deploying units. Consequently, every effort is made to keep their dental readiness high as well.

NDCPH Vision

"TO BE **THE** DENTAL CLINIC PEOPLE WANT TO COME TO." NDCPH strives to be **THE** health care organization where patients want to have their treatment done, **THE** facility where staff members want to come to work, and **THE** command where dental corps personnel actively seek to be stationed.

NDCPH Key Success Factors

To define the path to NDCPH's Vision, the Executive Steering Committee (ESC) identified the following Key Success Factors (KSFs):

Dental Health as it is reflected in quality and quantity of treatment provided and dental readiness of personnel.

Our People as they develop both professionally and personally.

Customer Satisfaction by improving access to care and making every effort to "WOW" our customers at every available opportunity.

Facilities by modernizing our facility and equipment thus enabling NDCPH to provide the highest quality services to our customers.

Organizational Relationship

NDCPH is one of 16 commands that make up the Navy Dental Corps. The Dental Corps provides dental services to military personnel throughout the world and is part of the Bureau of Medicine and Surgery (BUMED), the organizational center for all medical operations in the United States Navy. The organizational diagrams for BUMED and NDCPH are provided in figures 0.1 and 0.2.

NDCPH Support Departments

NDCPH's support service groups include the following:

Operating Management Department – ensures safety guidelines and environmental conditions are maintained.

Repair Department - installs and maintains dental equipment.

Administrative Department - responsible for all matters relating to personnel management, correspondence, wage and salary administration, professional credentials and administrative record keeping requirements.

EMPLOYEE DISTRIBUTION			
Assignment Type	Officer	Enlisted	Civilian
Direct Patient Care	25	34	26
Administrative Support	7 (1)	16	6
Dental Laboratory Support	0	11	0
Equipment Repair Support	0	3	0

(1) Includes two Medical Service Corps Officers responsible for both administrative and fiscal functions.

Figure 0.3

section of this overview for additional information.

Fiscal Department - manages all financial and budgetary matters.

Management Information Department - management information systems purchase, installation and operations; manages and integrates the Local Area Network (LAN).

Employee Base

NDCPH has 128 military and civilian employees distributed as described in Figure (0.3).

Education level: All 25 dental officers have graduated from accredited dental schools and are licensed to practice dentistry in at least one state. Nine of the dental officers have completed advanced dental training (one or two year programs in comprehensive dentistry or one of the dental specialties). Eleven of the dental officers are specialty trained (two-year programs) of which seven are Board Certified and four are pursuing Board Certification.

One enlisted individual has a master's degree, five have a Bachelor's Degree, and four have an Associate's Degree. All enlisted personnel have at least graduated from high school.

All civilian employees have at least graduated from high school. Seven have an Associate's Degree, nine have a Bachelor's Degree, and one has a Master's Degree.

Major Equipment, Facilities and Technologies

NDCPH's philosophies meet or exceed the standard of care in dentistry. Using state-of-the-art dental equipment, materials, and treatment delivery modalities, NDCPH provides services in most of the adult dental specialties including endodontics (root canals), periodontics (gum treatments), oral surgery (tooth removal), oral medicine (diagnosis), minor orthodontics, prosthodontics (bridges and dentures) and implantology (tooth replacements in the jaw bone). Specific command providers are trained in dental materials to ensure the best quality products are being used. Since NDCPH's facilities were constructed over 30 years ago, facility improvement is one of its KSFs for both the short and long term.

Customer Requirements

NDCPH provides state-of-the-art health care services to its customers. Major external customers and key outputs are provided in figure 0.4.

Customers (Patients). NDCPH's patient population requires quality dental care that is provided in a professional, courteous, safe, and timely manner.

Unit Commanders desire that their personnel are maintained dentally ready with minimal impact on mission.

The Bureau of Medicine and Surgery (BUMED) tasked dental commands to emphasize readiness and dental cleanings. Additionally, the Navy Surgeon General (the head of BUMED) emphasized customer service and taking treatment to the deckplates (where the sailors work).

The Commander Naval Base Pearl Harbor requires all of the above and periodically requests NDCPH's support for multiple volunteer efforts.

Supplier and Partnering Relationships

Supplier: NDCPH has an in-house Supply Department that procures "best value" supplies and equipment. Supply personnel can purchase items within a prescribed dollar amount (\$2500.00). Items that exceed that amount are ordered through the Fleet Industrial Supply Center (FISC).

Principle performance requirements for suppliers include: price; quality of product (meeting very specific product specifications); availability of product from a Federal agency contracted for special pricing; 30-day delivery for Government credit card purchases; customer service including ease of correcting orders or disputed costs. All procurement actions are meticulously recorded so historical data on supplier past performance is available.

Principle External Customers	Key Output
Active Duty Navy Patient Population	Dental Care
Unit Commanders	Dental Readiness (Sailors that are fit to fight)
Higher Authority:	
(1) Bureau of Medicine and Surgery	Completed Taskings Accountability
(2) Commander Naval Base Pearl Harbor	All of the above plus volunteerism

Figure 0.4

Please refer to figure 6.5 for a partial list of major suppliers.

Partnering. NDCPH shares resources with various military and civilian organizations. Specifically:

Continuing Education. NDCPH organizes Tri-Service (Army, Navy, Air Force) conferences, short courses, and dental study clubs. NDCPH and Branch Medical Clinic often share training assets and opportunities, especially in quality improvement and leadership training.

Treatment Capability. Tripler Army Medical Center (TAMC) provides Oral Surgical support, Orthodontic treatment, and Orthognathic surgical services (treatment to correct jaw position). NDCPH provides after-hours emergency services and the Oral Surgeon assists with complicated cases at TAMC surgical units.

Facility Availability. NDCPH provides on-the-job training for dental hygiene students from Northern Arizona University. They, in turn, provide increased patient access for dental cleanings. Naval Reserve

units use the facility for reserve duty and NDCPH's patients can access treatment on weekends. NDCPH is also used twice a year for board certification testing by both the Hawai'i Dental Board and Registered Dental Hygienist Board.

Assistant Training. Since 1975, NDCPH has operated an American Red Cross Volunteer Training Program. The volunteers receive extensive training and certification as a chairside assistant after volunteering for 500 hours. NDCPH benefits by having more assistants available to the health care providers.

Competitive Factors

As a military health care facility, NDCPH has no competition, *per se*, with respect to its mission. There are, however, competitive factors that may impact our mission.

Production and Staffing. The amount of dental treatment NDCPH "produces" correlates to the funding and personnel that NDCPH will be eligible to receive. As the "production" of dental treatment is compared with other Navy dental commands, NDCPH "competes" with them for money and people.

Wage Disparity. Staying within the confines of Government-imposed wage levels makes it difficult to attract and retain quality civilian health care providers. Civilian dentists offer attractively higher wages for the same skills. NDCPH strives to be competitive by offering a more professional work environment with greater opportunities to expand knowledge, experience and training.

Access to Patients/Patients' Access to Care. All dental commands compete for available work time of the personnel who maintain the Nation's security. To compete for that valuable time, NDCPH operates a Mobile Dental Unit (MDU), which has the treatment capability of a dental clinic with one notable advantage: mobility. It can be moved to the "deckplate" (where patients work), which significantly decreases the amount of lost man-hours in transiting to and from the dental clinic.

Other Factors of Significance to NDCPH

Regulatory Environment. NDCPH operates in an environment that requires mandatory compliance with safety, environmental, contracting, and legal regulations. The Occupational Safety and Health Administration (OSHA) and the Navy govern safety standards. Environmental regulations include Federal and Hawai'i State laws. Many goods and services must be obtained using contracting procedures mandated by DOD and the Navy. Legal requirements are determined by the Uniform Code of Military Justice, and Federal and State laws.

The Future. NDCPH anticipates that future operating budgets and employee staffing will decrease. Budgetary modifications possibly will be aligned with civilian operating costs. NDCPH also anticipates that military healthcare will progress towards the Tri-Care model, a more encompassing system similar to Health Management Organizations. Currently NDCPH does not compete with other local military dental organizations, but this may change if all segments of the military healthcare system adopt a "single-service" approach. NDCPH's aim is to implement innovative services to benefit our customers. We will continue to seek opportunities to respond to customer input including taking dental treatment to the "deckplates".

Summary

NDCPH provides quality dental care to military personnel and its "reason for being" is to ensure the nation's Sailors and Marines are "fit to bite, fit to fight!" NDCPH is committed to continual improvement, empowerment, and openly embracing the challenges ahead. NDCPH will have a "Change of Command" (new Commanding Officer) this summer and we believe the criteria and award process reflected in the Hawai'i State Award of Excellence offer the most viable approach to "institutionalize" and provide continuity to improvement efforts.

SECTION 7.0 BUSINESS RESULTS

NDCPH monitors performance in its Key Success Factors (KSFs) using metrics listed in figure (1.4). The following graphs and charts describe NDCPH's performance in each of the KSFs.

7.1 Customer Satisfaction Results. The following graphs represent performance in the KSF of Customer Service in the Key Objective of Customer Satisfaction.

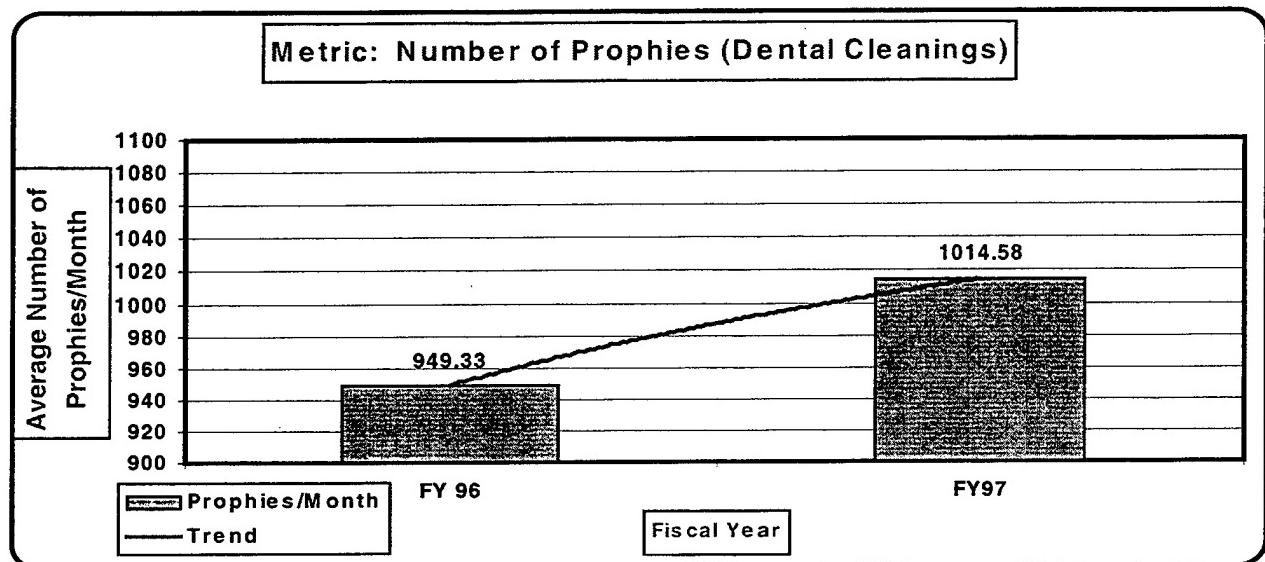


Figure 7.1.1

Patients indicated by survey that they desired more dental cleanings. Late in 1996 NDCPH initiated two programs ("One-Stop Shopping" and a "Phased Cleaning with Dental Technicians and Registered Dental Hygienists"), which provided more access to the service. NDCPH also initiated a "Prophy Technician Training Program" which further expanded the capabilities in both of the programs.

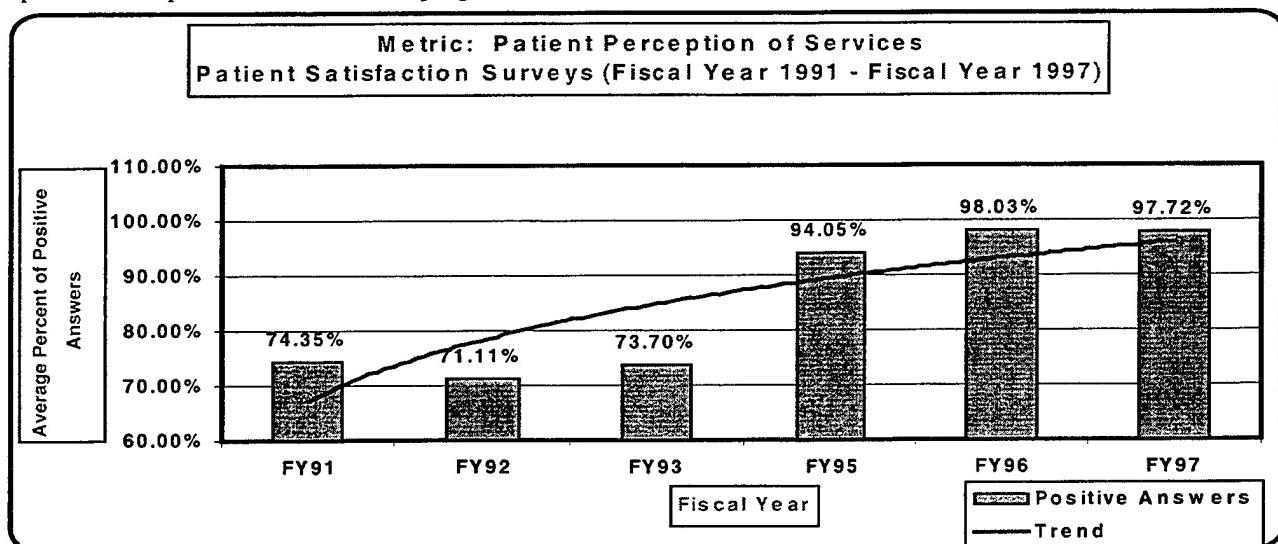
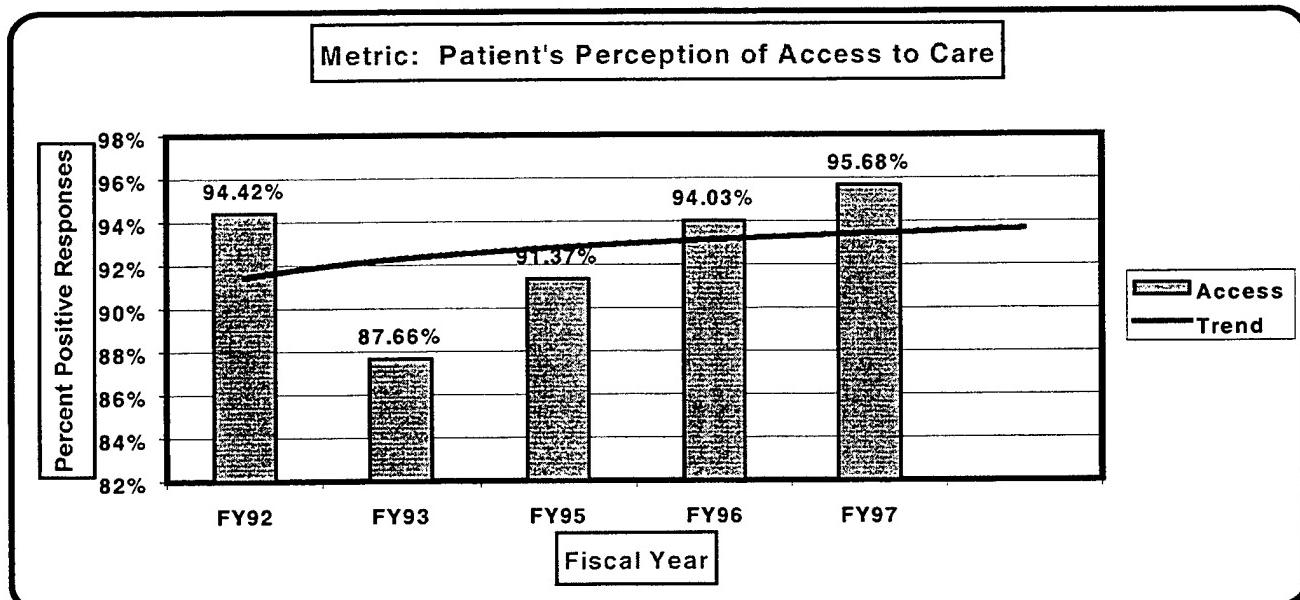


Figure 7.1.2

Patient Satisfaction Surveys provide NDCPH with the most effective means of objectively assessing how patients perceive the services that are provided. Data presented in figure 7.1.2 represents "positive" answers to survey

questions. Individual surveys were tabulated for Fiscal Years 1991 – 1993 due to a change in summary report information. Fiscal Year 1994 is not presented in the data as only negative responses were recorded and no



individual surveys were available. NDCPH determined that the data would therefore be too inaccurate to be used. Figure 7.1.3

The patient's perception of access to care (ability to get a treatment appointment) is a major concern for NDCPH. Although operating in a "downsizing" philosophy intensifies that concern, NDCPH continued to modify processes to limit the impact on patients' access to care. Despite the fact that NDCPH experienced a significant decrease in assigned treatment providers, it managed to keep a strong focus on Customer Service. Data for Fiscal Year 1995 includes partially extrapolated information. Information for Fiscal Year 1994 was limited such that the

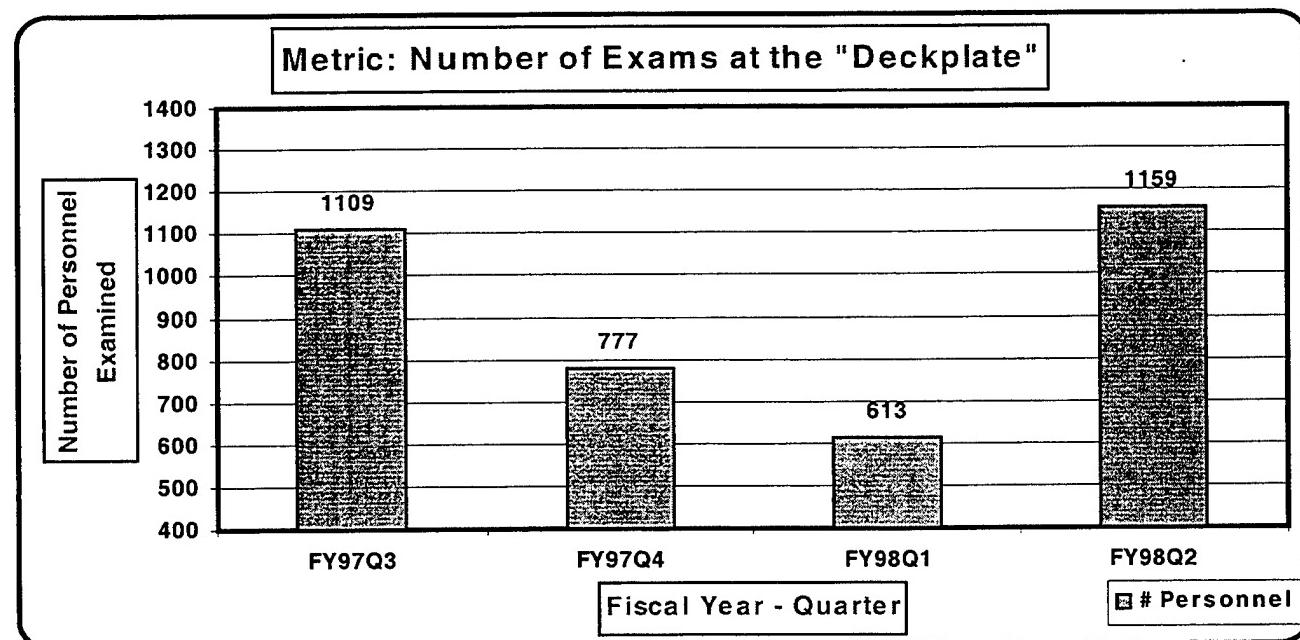
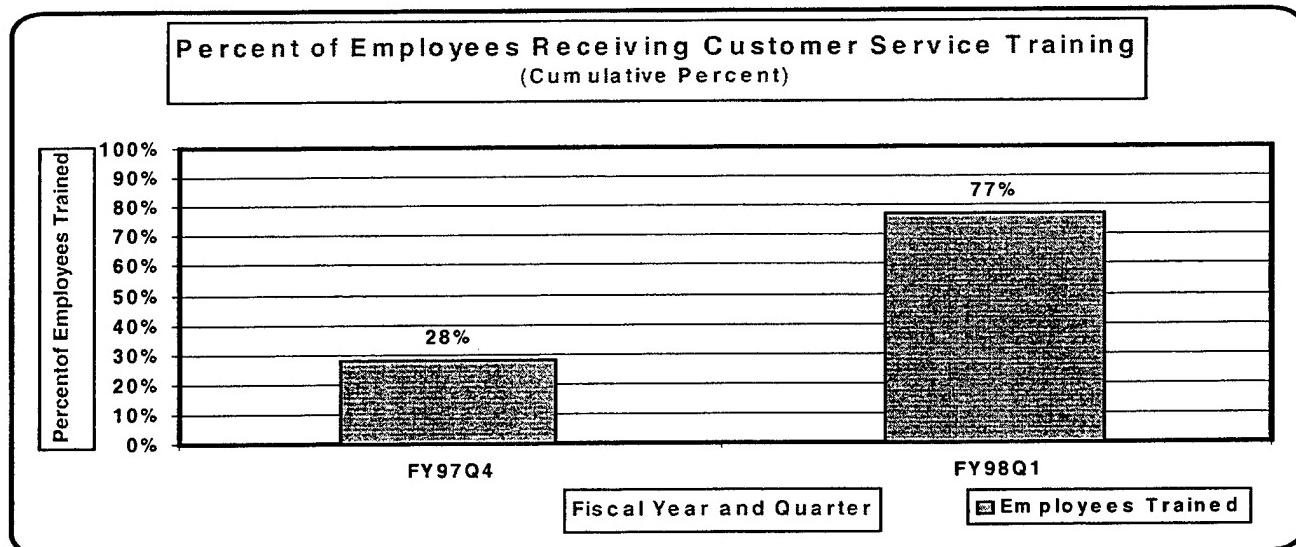


Figure 7.1.4 data was considered unreliable.

The "Deckplate" is where the Sailors work. By modifying the "examination paradigm" and expanding services to units using the Mobile Dental Unit, satellite clinics, and temporary exam sites on units, NDCPH was able to provide 4386 exams at the deckplate in Fiscal Year 1997. This represented savings of approximately 8772 man-hours for



customers.

Figure 7.1.5

NDCPH focuses on customer service and strives to have all employees trained in servicing our customers. With the "stretch goal" of 100% of employees trained in customer service, periodic transfer of military personnel necessitates scheduling organized Customer Service Training on a Quarterly basis. Presently the remaining 23% of the personnel are scheduled for training at the end of May 1998. A total of four employees received "instructor level" training and provide the training locally to NDCPH employees. The instructors are also providing customer service training to other commands on Pearl Harbor in May – June 1998.

7.2 Financial and Marketplace Results

As a military healthcare organization NDCPH operates in a strictly non-profit setting. However, dental readiness may be interpreted as a marketplace gain. Production may be interpreted as a vehicle to compete for personnel and available budget for healthcare facilities.

Our most important function is to deploy (send out) ships and submarines in a "dental ready" status. Prior

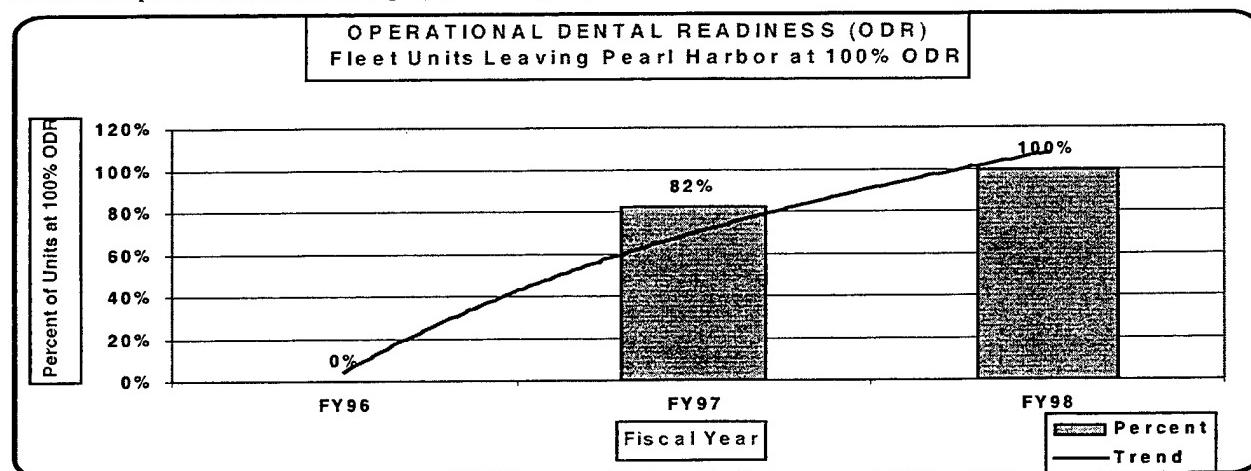


Figure 7.2.1

to 1997, fleet units deployed with the number of personnel classified as "dental ready" in the range of 78% to 97%. NDCPH's Fleet Liaison Office, with the support of health care providers, committed to "raising the bar". The last

20 ships and submarines to deploy did so with 100% of personnel in a dental ready status. This achievement is unprecedented Navy-wide.

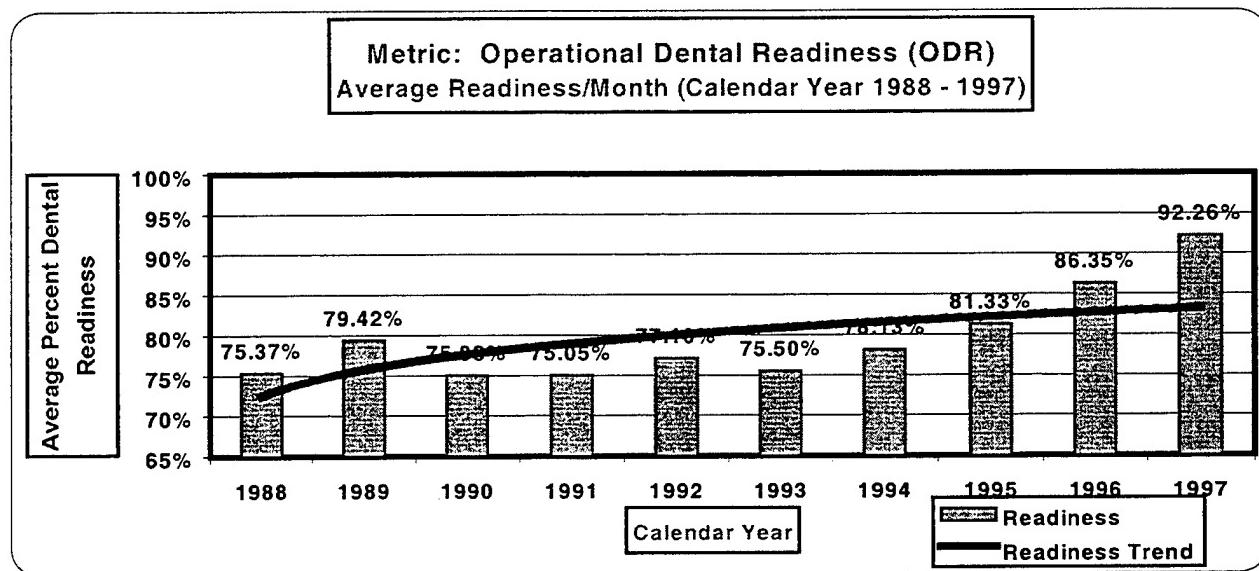


Figure 7.2.2

The term "Dental Readiness" refers to a unit's percent of personnel that are Dental Class 1 (no dental work required) and Dental Class 2 (minor dental work that would not be considered a high potential for emergency within 12 months). The higher readiness is, the more "mission capable" (able to complete their assignment) a unit is. This is especially significant when a submarine or ship is deployed (away from home port). Four data points (December 1994 – September 1995) were derived using interpolation trend analysis due to data not being available.

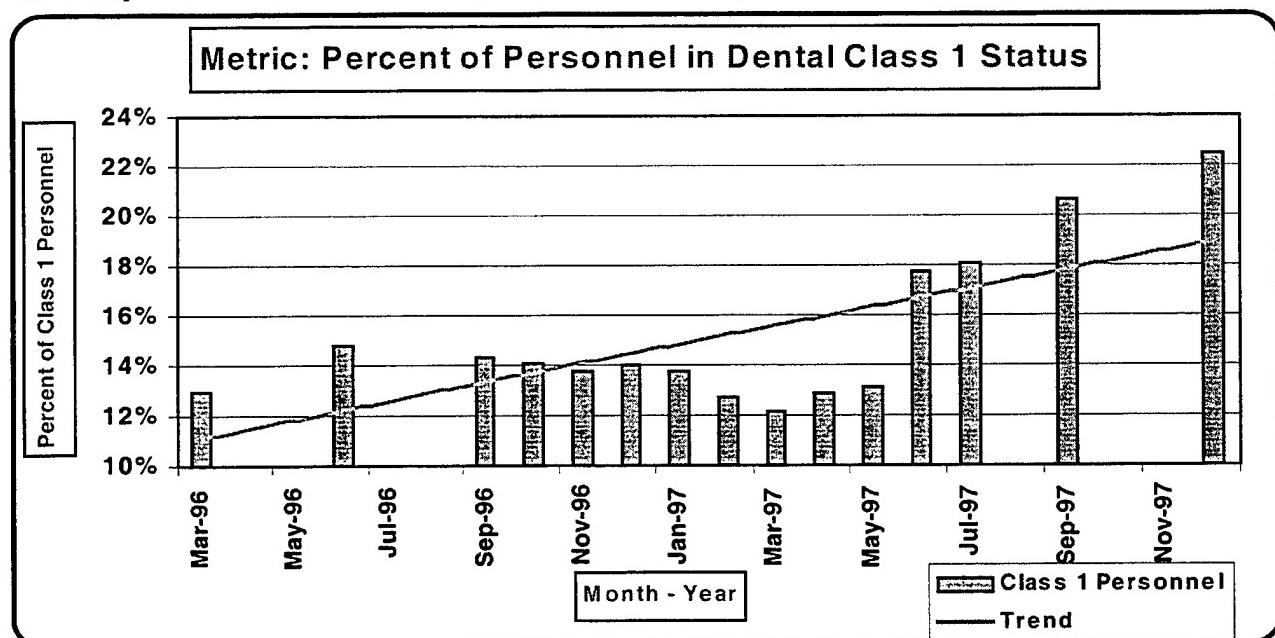


Figure 7.2.3

Dental Class 1 personnel do not require any dental work to be completed and therefore are considered to be in the best possible state of "dental health". Class 1 data was not available for some data points above.

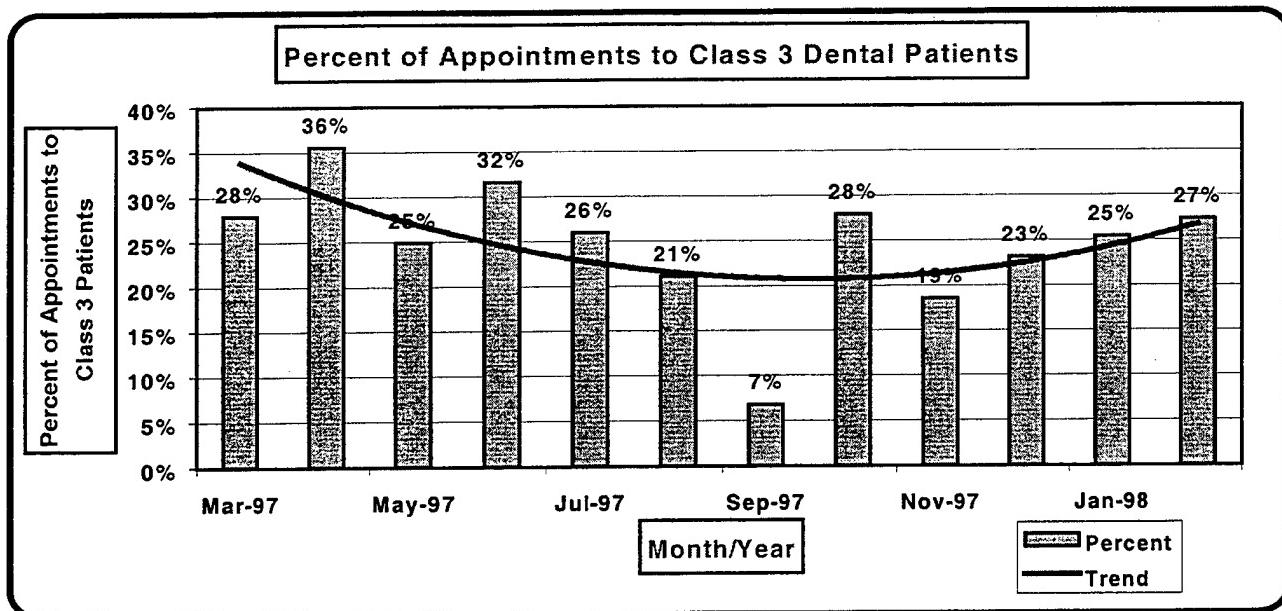


Figure 7.2.4

Patients that are Dental Class 3 (treatment required may cause a dental emergency within 12 months if not completed) present with the most complex treatments and the highest potential for dental emergency. NDCPH branch dental clinics give highest priority to dental class 3 patients, often extending their appointment books weeks in advance to accommodate them. Incomplete data presented for September 97 due to non-availability. As readiness increases a decrease in Dental Class 3 patients would be realized and may impact on the percent of appointments to those patients.

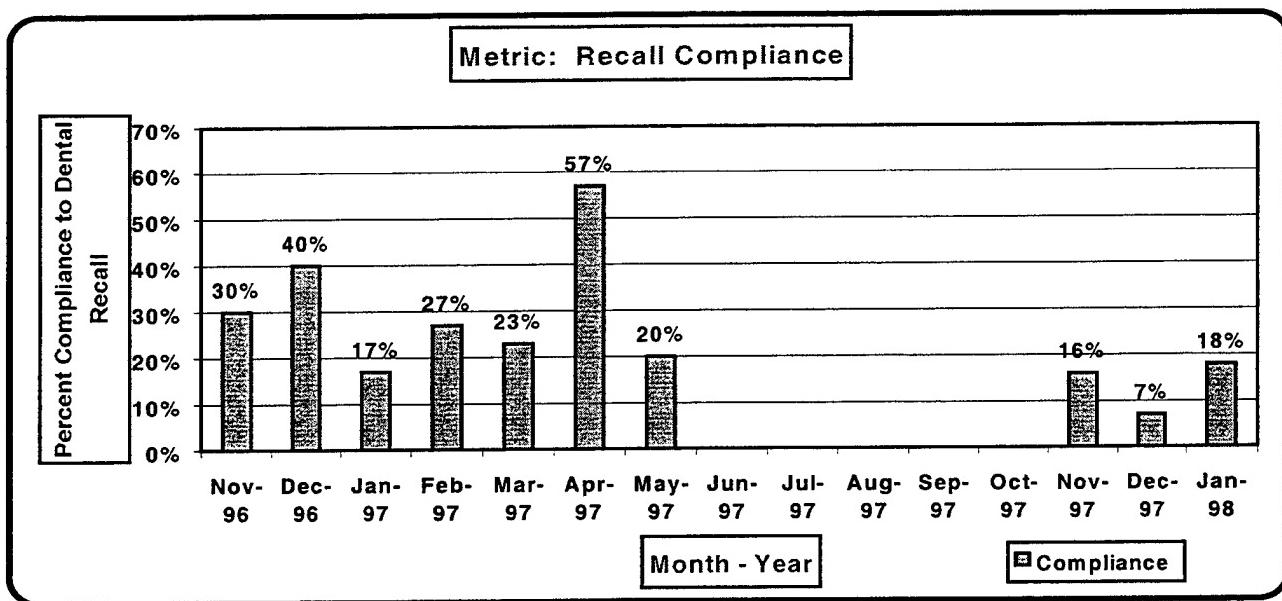


Figure 7.2.5

One of the greatest obstacles to achieving dental health is not having patients answer recall notices. This metric was under reconsideration from June to October 1997. Data collection methods improved and a more significant "customer group" was identified. Although NDCPH's performance for "recall compliance" appears poor, the process is being further assessed for modification and potential for improvement in the future.

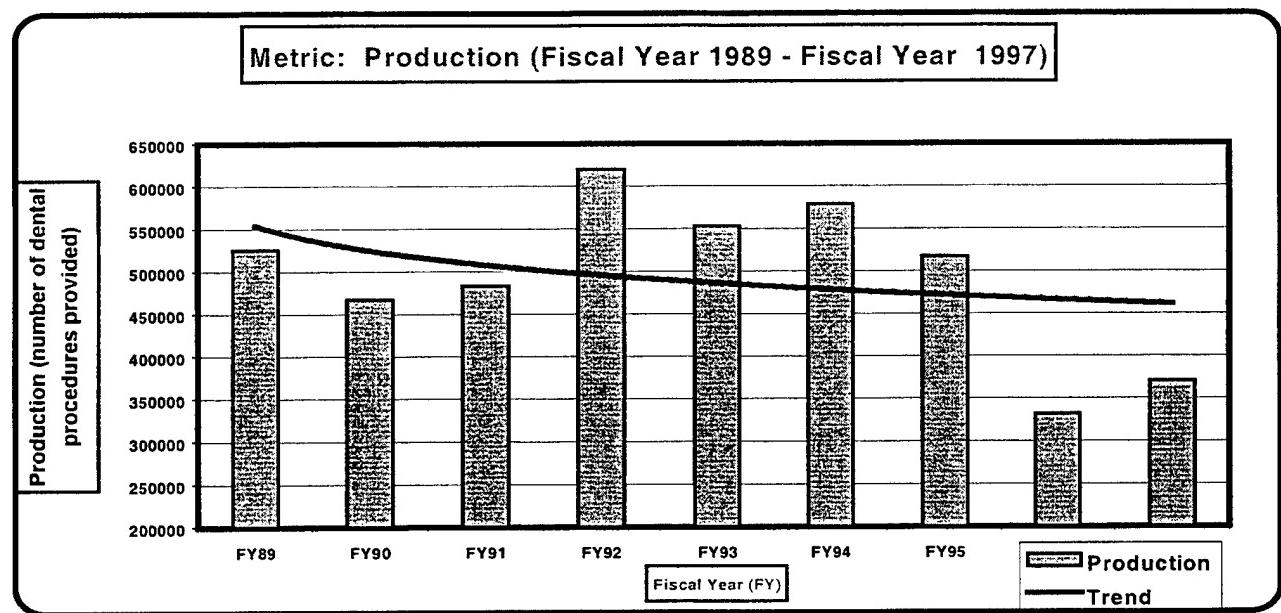


Figure 7.2.6

Production (the amount of dental treatment that is provided to patients) trend decreased from Fiscal 1989 to Fiscal Year 1997. During this period, from data that is available, NDCPH experienced a decrease in dentists from an average high of 34.25 to the Fiscal Year 1997 average of 28.92, the lowest recorded for NDCPH. Despite the burden of working with less, production for Fiscal Year 1997 actually increased by approximately 12% when compared with Fiscal Year 1996.

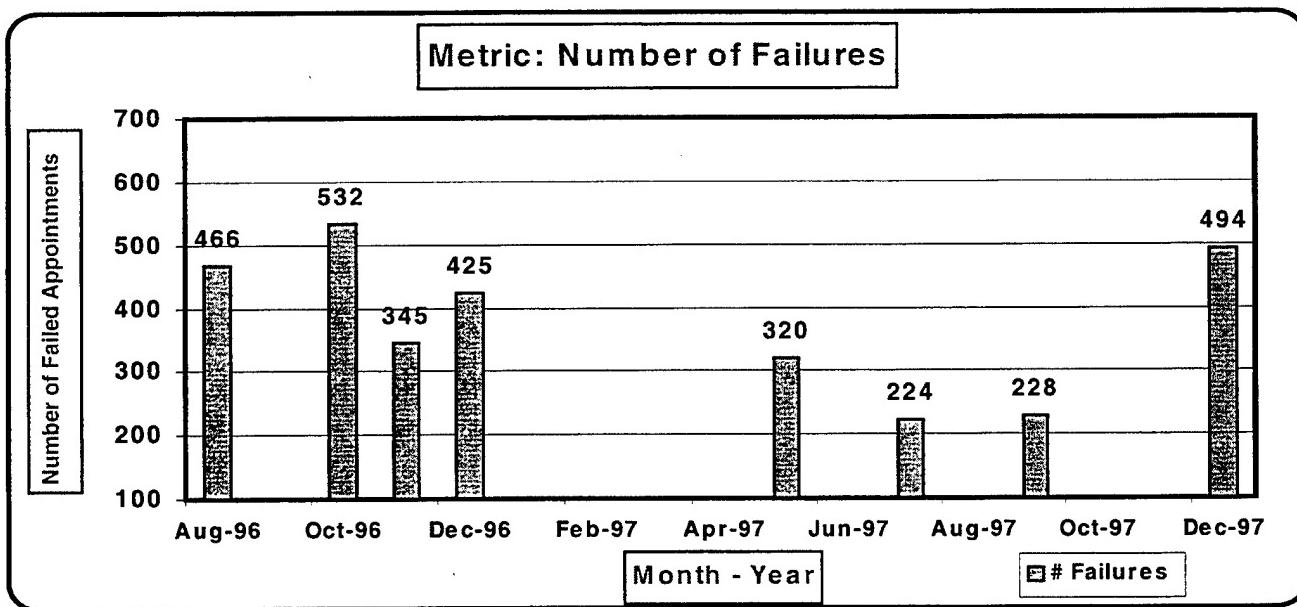


Figure 7.2.7

Patients failing to keep treatment appointments wastes provider time (production) and impacts on readiness. The holiday period in December commonly is one of the highest failure rates experienced. Some data points in the graph above lack sufficient data to be reliable and therefore were not included.

7.3 Human Resources Results.

NDCPH strives to create an enthusiastic work environment in the Spirit of Aloha and provide its employees quality training to complete their responsibilities and expand their capabilities. Offering assistance and organizing effective programs, NDCPH promotes its employees professional and personal development.

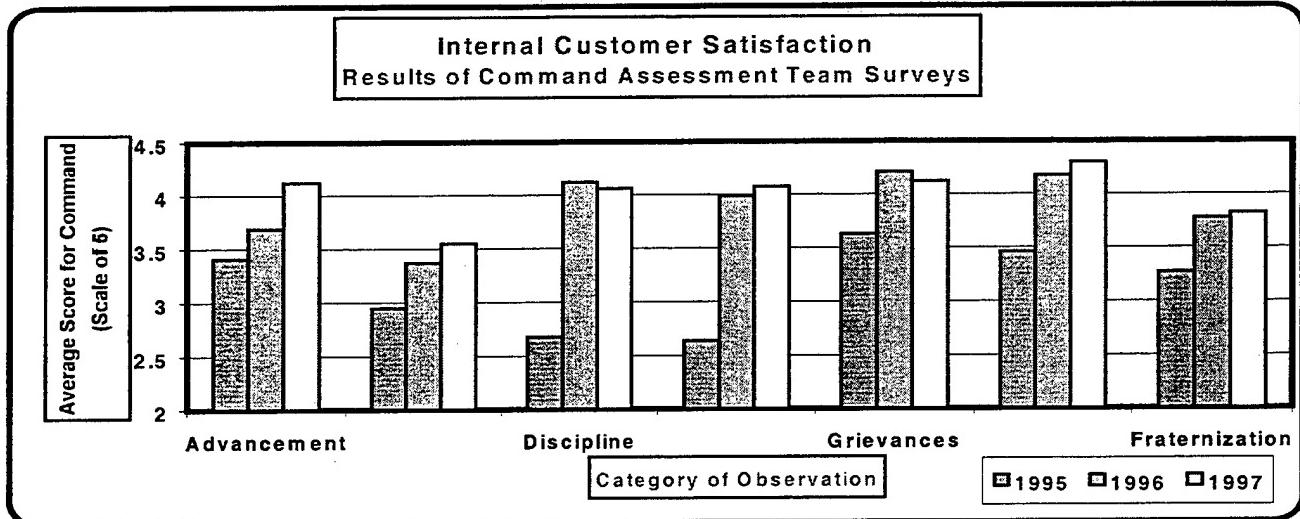


Figure 7.3.1

Command Assessment Team (CAT) surveys are provided to all employees annually to determine the working "climate" at NDCPH. Although a variety of topics are addressed on the surveys, the most significant areas are presented in figure 7.3.1. Each of the four areas are assessed using an average score where "5" is the best and "1" is the worst. Areas presented are: "Advancement", the opportunity to increase in rank or position; "Discipline", that NDCPH is fair and equal in disciplining employees; "Grievances", that employees understand the grievance procedures and have not experienced the necessity for filing one; "Fraternization", that the guidelines and boundaries are firmly set and understood regarding employees fraternizing and that fraternizing is not a problem in

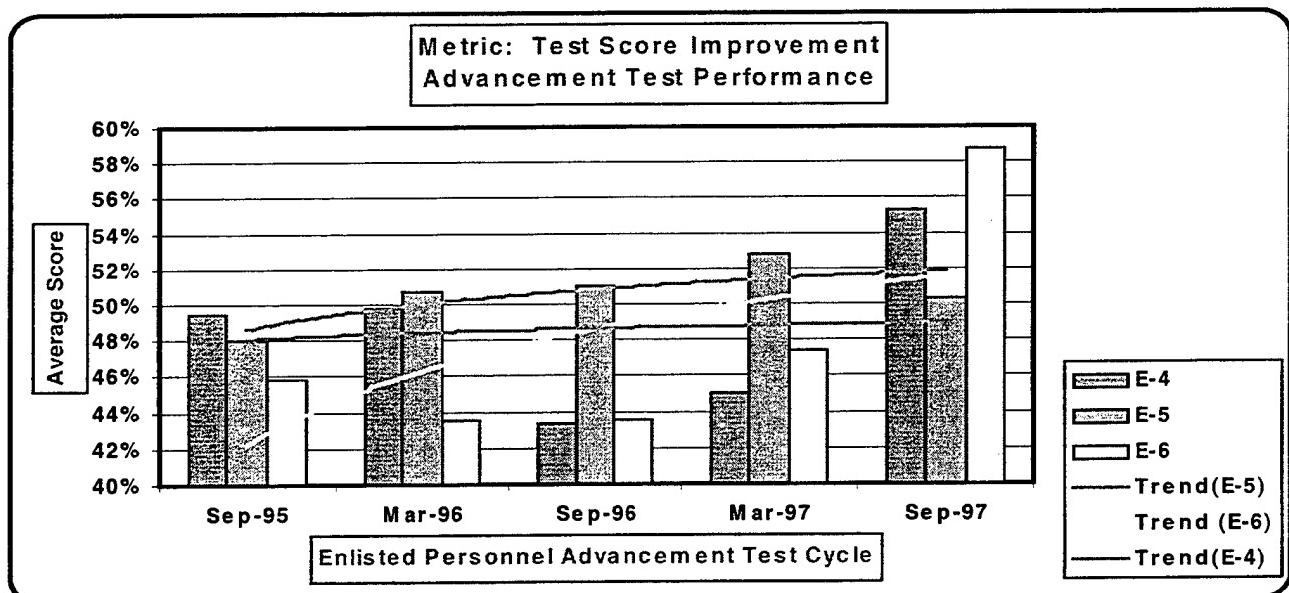


Figure 7.3.2 NDCPH.

Enlisted personnel must take tests to advance until they reach the Chief Petty Officer (senior supervisor) level. Tests are given in two cycles per Fiscal Year. Trends reveal positive performance. Average test scores were used in figure 7.3.2.

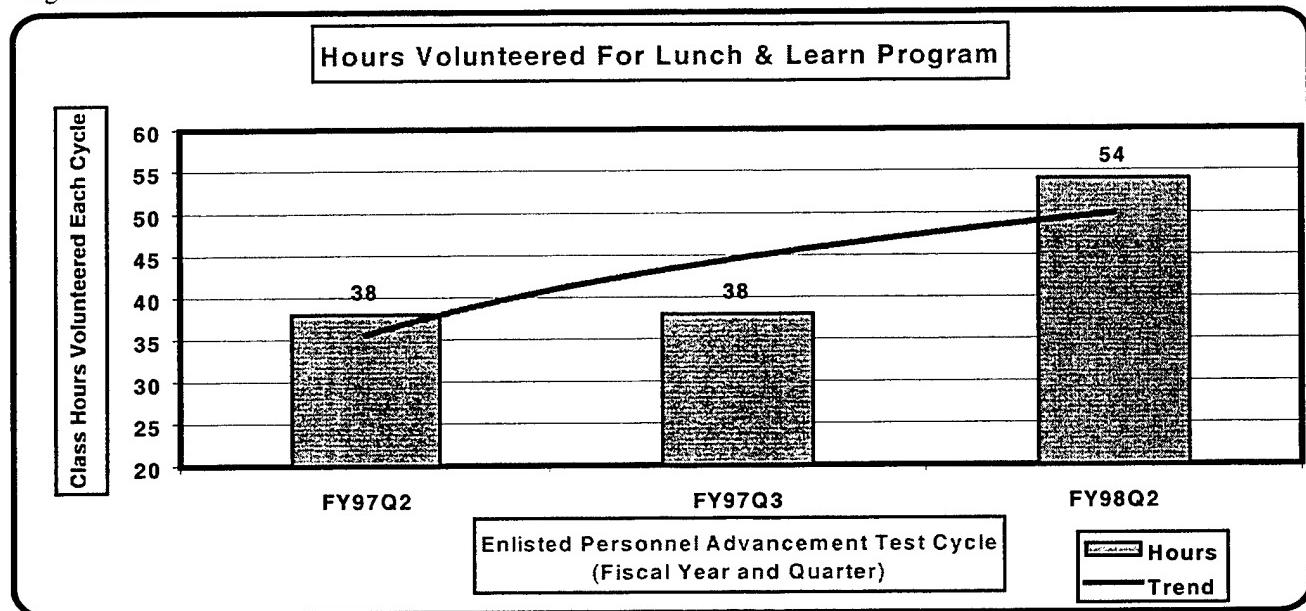


Figure 7.3.3

NDCPH initiated the “Lunch and Learn” program to assist enlisted employees in preparing for the advancement tests. Senior enlisted and officers volunteered to give lectures on specific advancement topics during lunch periods, ergo the term “Lunch and Learn”.

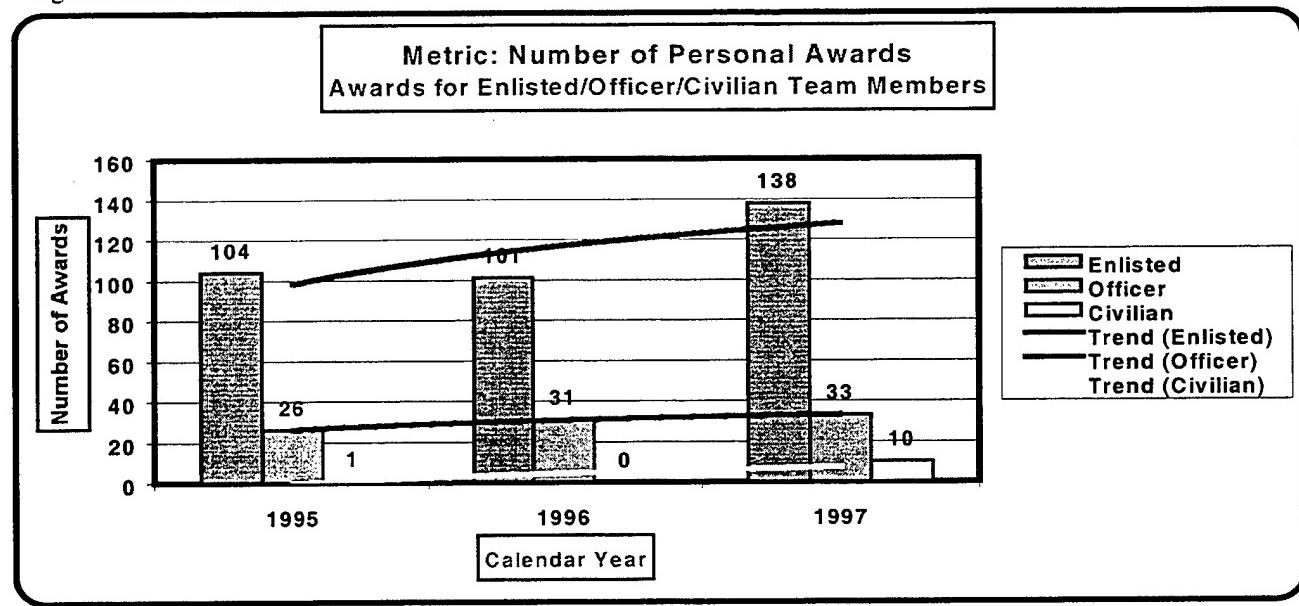


Figure 7.3.4

One method of compensating employees at NDCPH is by issuing personal awards in the form of Letters of Commendation and medal awards. Civilian employees may also qualify for monetary awards. In tabulating the data presented in figure 7.3.4, only personal awards warranting medals and letters of recognition from the Commanding Officer of NDCPH or from higher authority (e.g. Admiral or General) were considered. Other means of recognition at NDCPH, e.g. “Spout Abouts”, “Team in the Spotlight”, and Department letters of recognition were not included in the data.

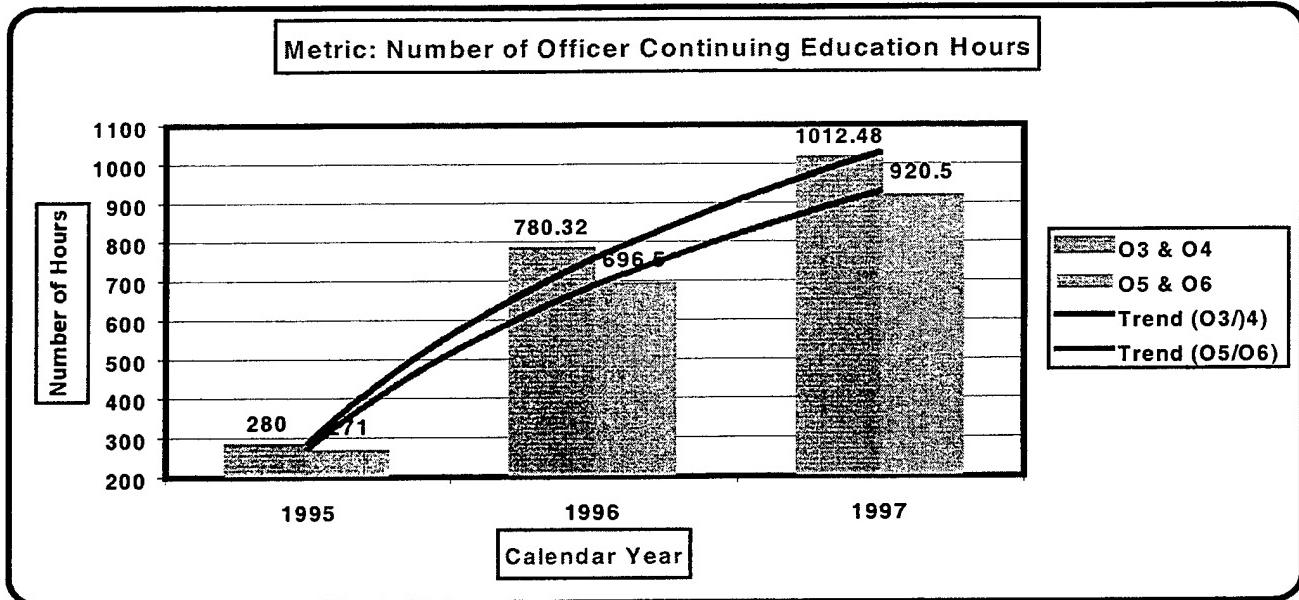


Figure 7.3.5

Professional continuing education is necessary to keep abreast of the rapid developments in dental technology and techniques. Most states also require a minimum number of continuing education hours per year to maintain an active dental license. Funding sometimes restricts opportunities for officers to receive training. NDCPH strives to provide the maximum in training opportunities for all employees. In figure 7.3.5, Lieutenants (O-3) and Lieutenant Commanders (O-4) are referred to as "Junior Officers". Commanders (O-5) and Captains (O-6) are referred to as "Senior Officers"

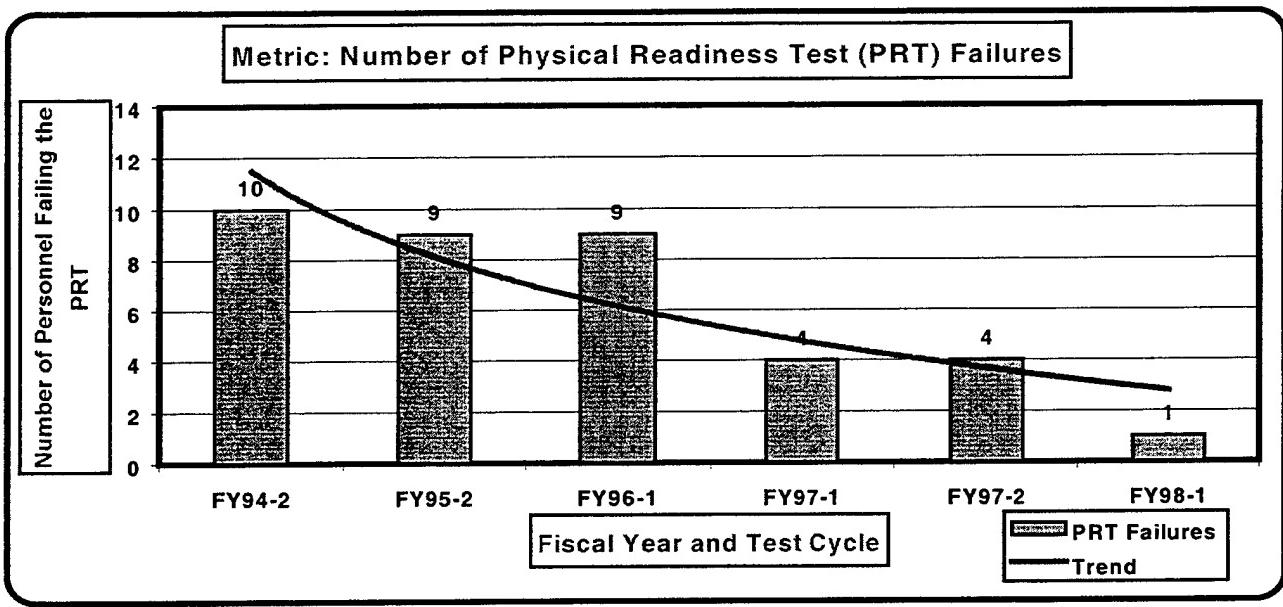


Figure 7.3.6

All military personnel are required to take semi-annual Physical Readiness Tests (PRT) to demonstrate acceptable levels of endurance, cardiovascular health, and flexibility. Civilian employees are not required to participate in the testing but are invited to participate. If an individual fails the PRT, they are given the opportunity to improve by participating in NDCPH's Remedial PRT Program. Data was not available for the second PRT cycle in Fiscal Year 1996.

7.4 Supplier and Partner Results

Although suppliers are selected using mandated guidelines, past performance of key suppliers has been excellent and without major problems. NDCPH's requirements are understood and complied with by all suppliers.

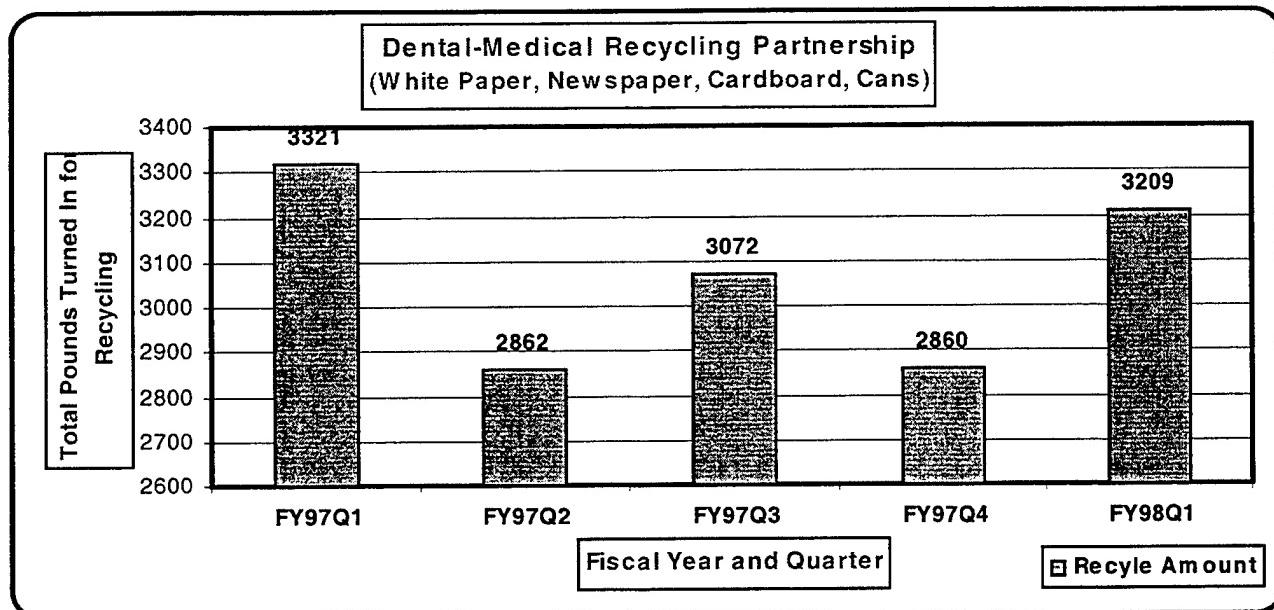


Figure 7.4.1

NDCPH partners with the Branch Medical Clinic on the recycling effort as medical had the funding to begin a recycling contract and both commands share the same building. The co-location helps in the management of the materials and logistics of disposal.

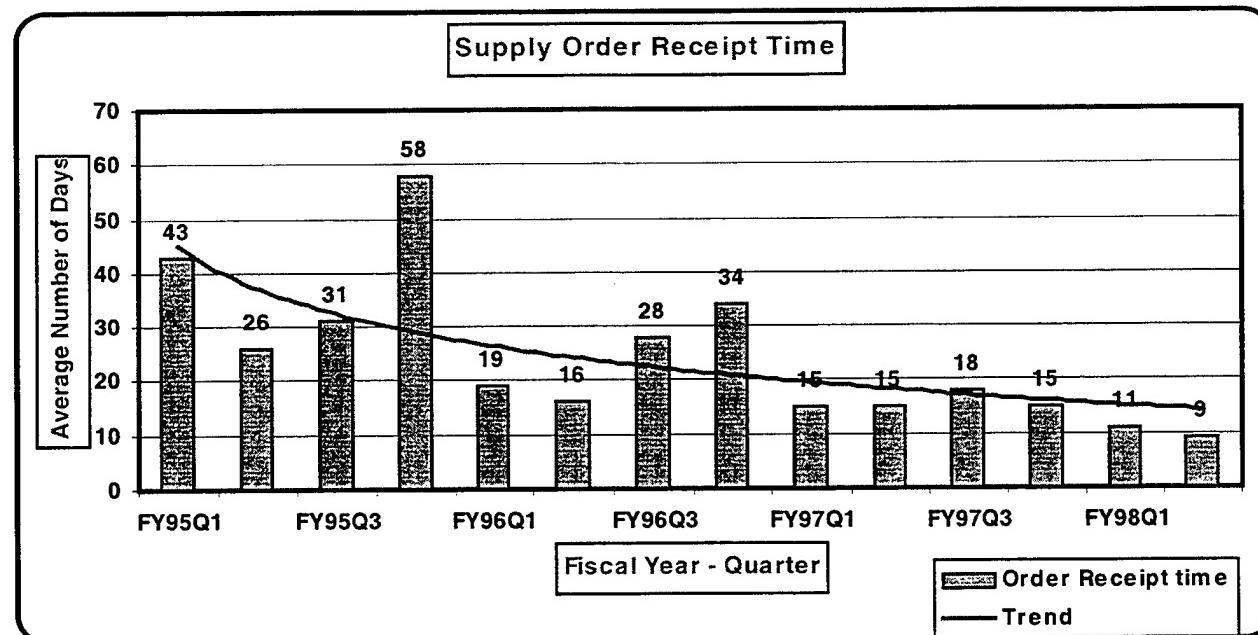


Figure 7.4.2

As noted above the average supply order receipt time has dropped significantly since NDCPH began using the Government Credit Card to order materials and supplies. Decreasing the supply order-receipt-lag significantly reduces the amount of supplies on inventory and enhances materials availability for providing dental care.

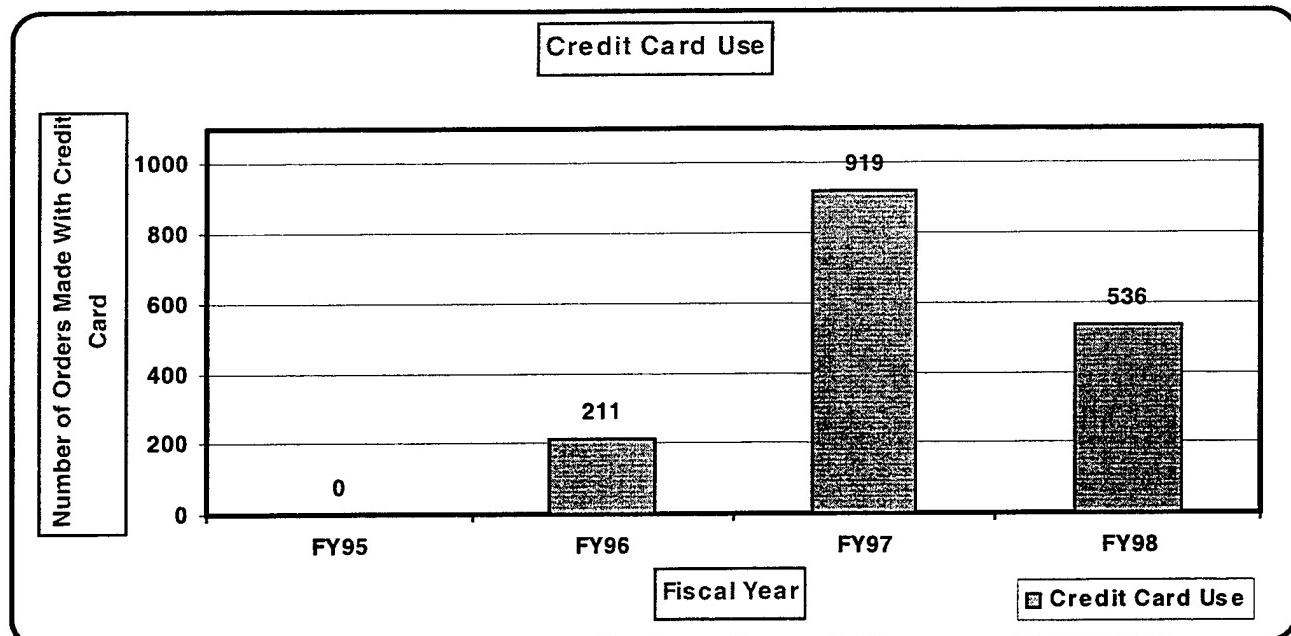


Figure 7.4.3

As noted in figure 7.4.2, use of the credit card has a significant impact on decreasing order receipt time. Figure 7.4.3 depicts the increased use of the card since its availability in Fiscal Year 1995. Use of the card was not mandatory until Fiscal Year 1998. Data for 1998, of course, represents use as of the second Quarter of the Fiscal Year.

7.5 Company Specific Results. As a military organization and a healthcare facility, NDCPH has several foci of importance to the organization. The following figures describe the more prominent areas.

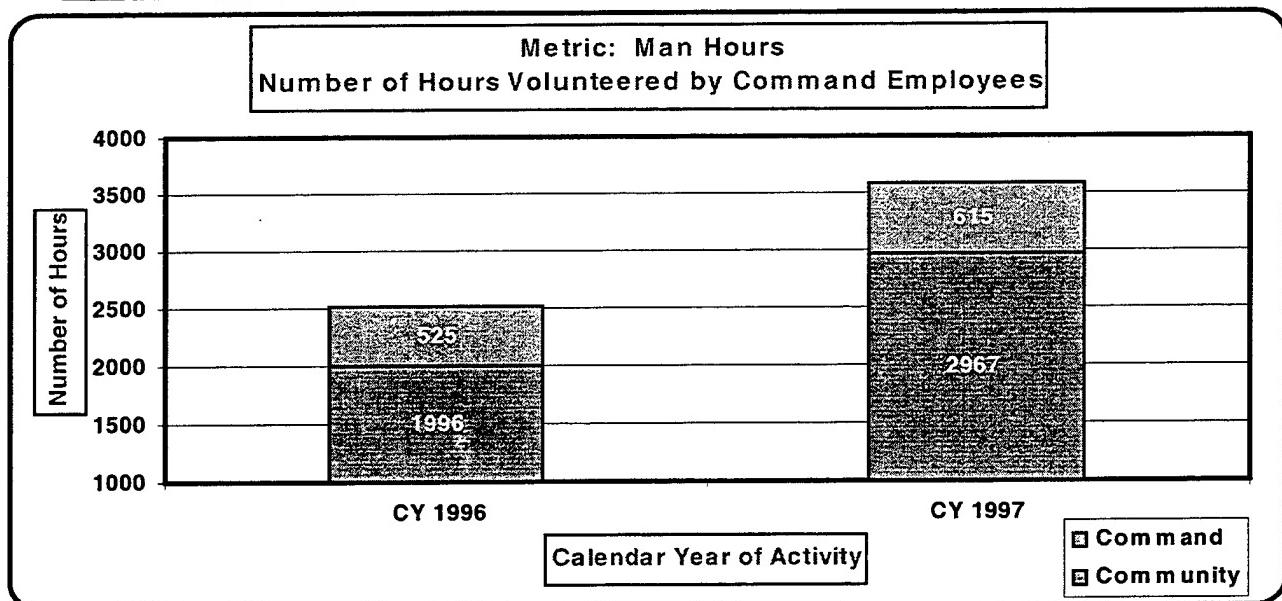


Figure 7.5.1

NDCPH combines volunteering in the organization and the Spirit of Aloha by stressing volunteerism in the local community and efforts to aide those less fortunate who live in Hawai'i. NDCPH reinforces the importance of volunteering by including it in specific employees' award consideration.

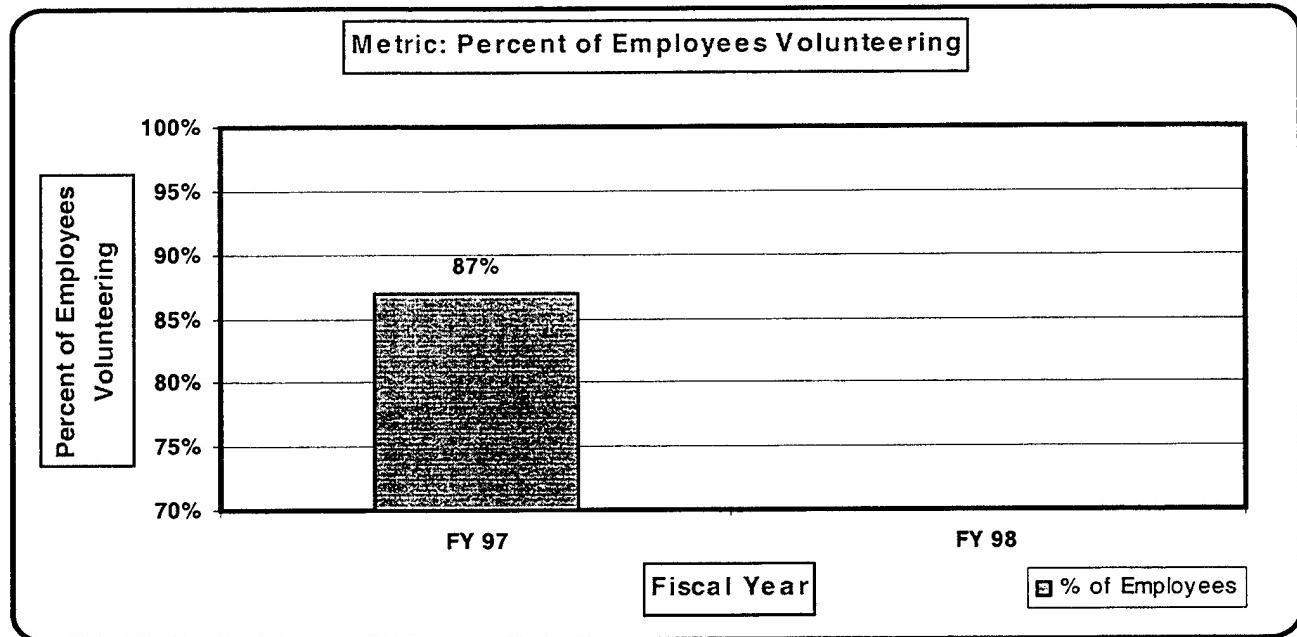


Figure 7.5.2

NDCPH encourages all of its employees to volunteer both in the local community and in the command. With this new metric NDCPH will be able to monitor and review volunteerism from a broad perspective.

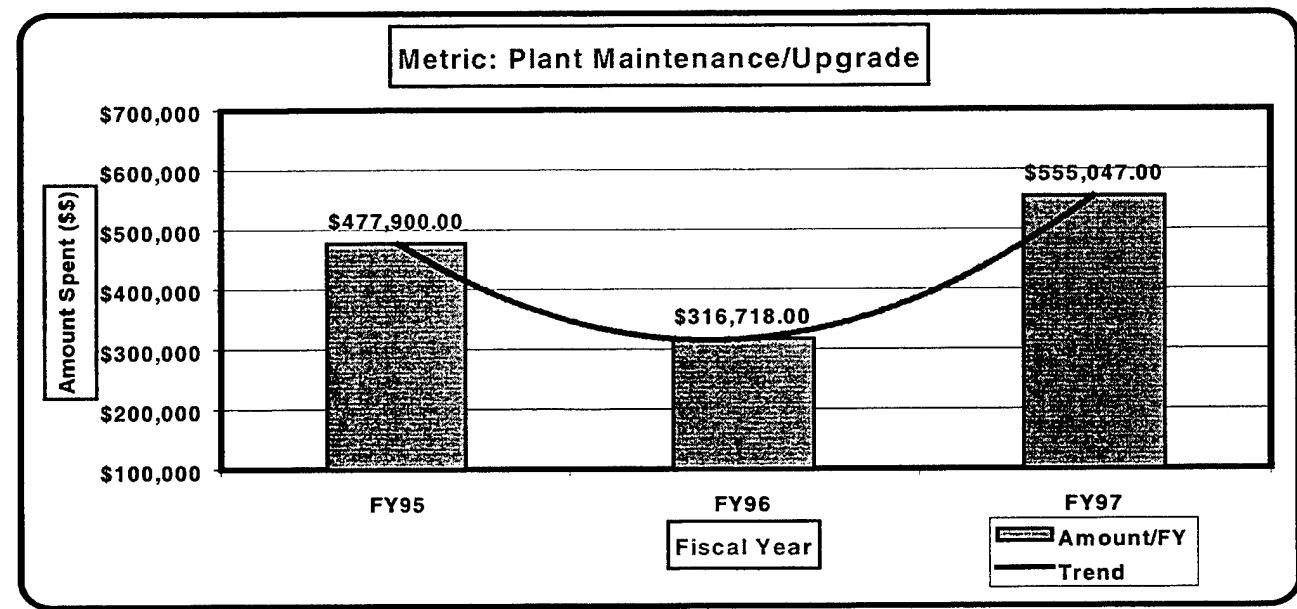


Figure 7.5.3

NDCPH's facilities need to be at "the cutting edge" for dental care providers to deliver quality, above standard-of-care services. It is difficult to determine the Plant Value Replacement due to the number of branch dental clinics in NDCPH and the building ownership disbursement. Although not remarkable, figure 7.5.3 reflects a continued effort to provide a clean and problem-free space for employees to work.

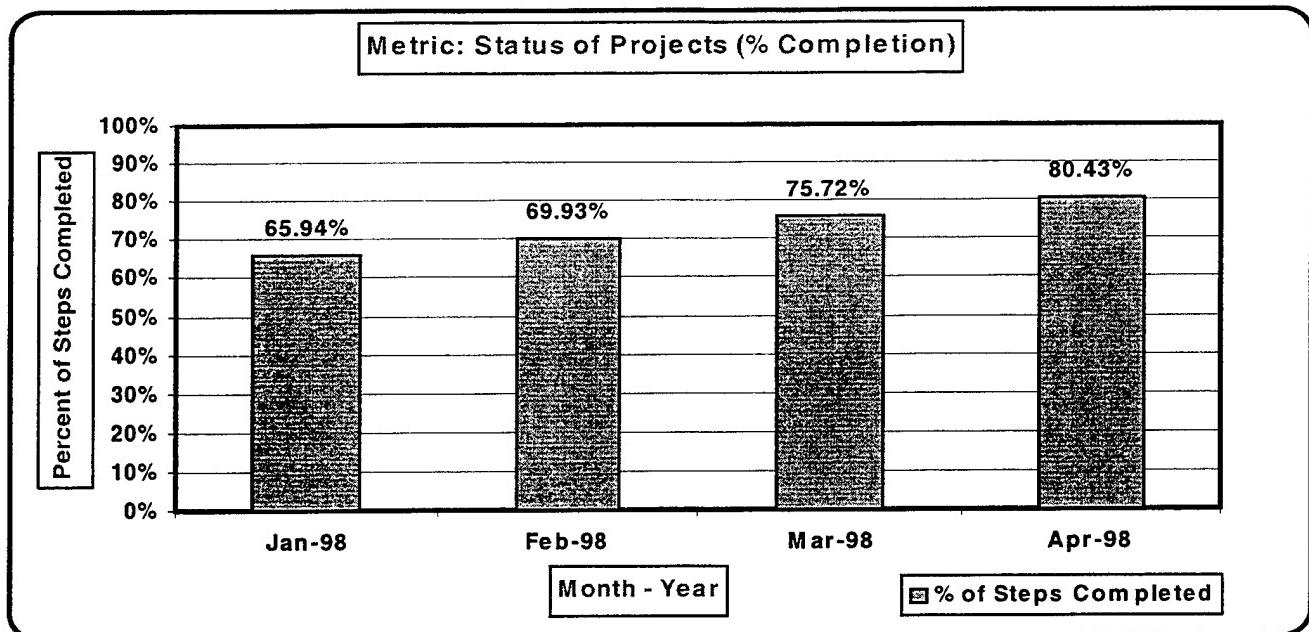


Figure 7.5.4

NDCPH monitors progress with projects to ensure that improvement efforts do not stall and enthusiasm in its employees does not fade. When progress lags, senior leadership reviews causes for delays with the Operating Management Department Head.

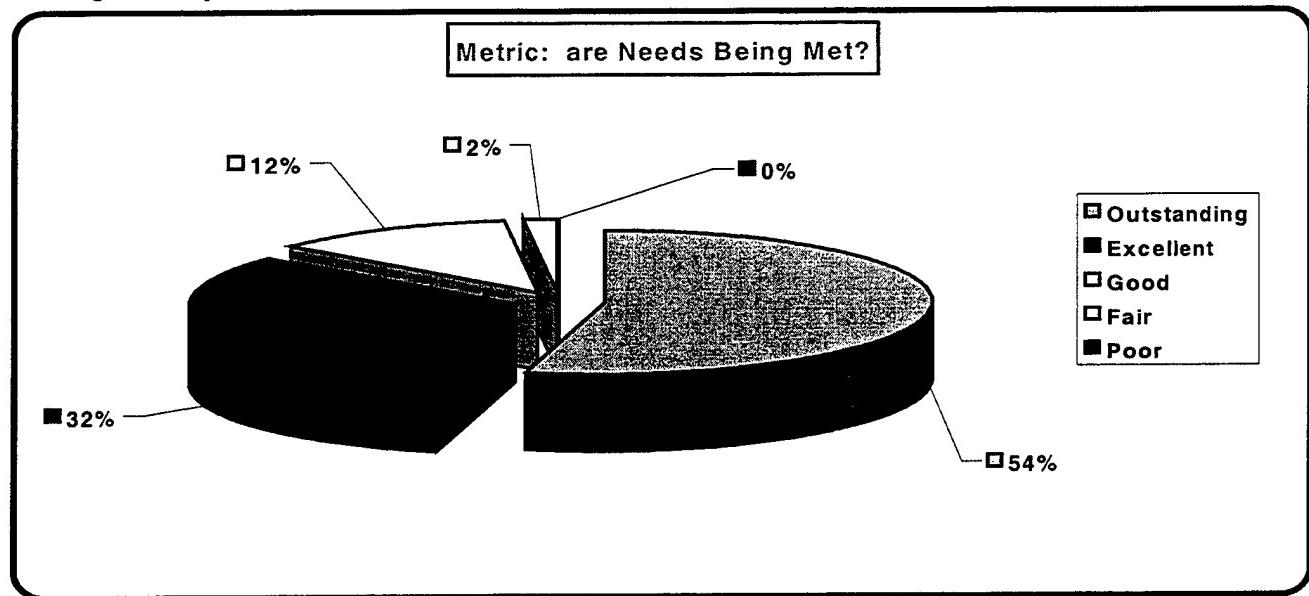


Figure 7.5.5

The Supply and Repair Departments internal customer satisfaction is represented in figure 7.5.5. Those two support service teams were selected since they have the most impact on patient treatment. Patient treatment is, of course, the main vehicle to achieving NDCPH's mission of dental readiness and overall customer health. At 86% of internal customers considering the service as either "Outstanding" or "Excellent", overall performance in meeting customer needs should be considered above the standard. Information presented in figure 7.5.5 was tabulated in the most recent internal customer survey. Staff provided information regarding their satisfaction with the services provided by the NDCPH support teams.

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